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ABSTRACT

The purpose of this "Reading Aid" is to help teachers and other school personnel responsible for selecting readiness programs to evaluate those programs they are considering for selection. The programs reviewed here represent a cross-section of the many language and perceptual readiness programs available. The assumption underlying each of these programs is that mastery of the readiness skills identified in the program contributes to later school achievement. The programs discussed range from sets of simple visual-motor and auditory discrimination tasks, to combinations of complex tasks, to tasks involving reception and production of language. The programs are designed to improve oral language or to encourage perceptual-motor development. The programs reviewed include: Peabody Language Development Kit-Level 2, Auditory Discrimination in Depth, Perceptual Training Procedure, Developing Learning Readiness, Pathway School Program, Frostig Program for the Development of Visual Perception, Pictures and Patterns, Fairbanks-Robinson Program-Level 1, and Erie Program. (WR)

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Critical Reviews

Maurice Kaufman
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CONTENTS

Foreword v

1 Purpose and Preparation

3 Program Evaluation

7 Peabody Language Development Kit – Level 2

14 Auditory Discrimination in Depth

19 Perceptual Training Procedure

22 Developing Learning Readiness
Response by G. N. Getman 25

28 Pathway School Program
Response by G. N. Getman 30

32 Frostig Program for the Development of Visual Perception

38 Pictures and Patterns: The Frostig Developmental Program

46 Fairbanks-Robinson Program – Level 1

49 Erie Program

53 Appendix

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The writer wishes to acknowledge his gratitude for the fine cooperation given by the reading specialists who prepared the initial drafts of the reviews, and the authors of the readiness programs who responded to his solicitation. He assumes responsibility for criticisms of the programs included in this publication.

FOREWORD

For seventy-five years educational literature has reflected the concern of educators about pupils' readiness for instruction. In more recent years these theoretical concerns have been paralleled by the publication of instructional programs designed to stimulate the development of one or more of the many aspects of readiness.

This monograph provides two types of assistance to teachers and administrators who are considering the use of perceptual and language readiness programs. The authors provide critical reviews of nine programs now available; they also include an evaluation form which will aid in determining which readiness program is most appropriate to the needs of a particular group of children. The Association expresses its appreciation to Maurice Kaufman, editor of the monograph, and to the contributing authors.

Millard H. Black, *President*
International Reading Association
1973-1974

The International Reading Association attempts, through its publications, to provide a forum for a wide spectrum of opinion on reading. This policy permits divergent viewpoints without assuming the endorsement of the Association.

Chapter 1

PURPOSE AND PREPARATION

In recent years numerous published readiness programs have appeared on the market. These have been offered to the schools as a means of developing sets of skills considered by the authors to be prerequisite to academic skills such as reading and arithmetic computation. The programs are intended for use with kindergarten and first grade children, although some may be used in remedial programs as well. The assumption underlying each of these programs is that mastery of the readiness skills identified in the program contributes to later school achievement.

• Purpose

The purpose of this *Reading Aid* is to help teachers and other school personnel responsible for selecting readiness programs to evaluate those programs they are considering for selection. If one of the nine language and perceptual readiness programs reviewed herein is being considered, the teacher should also seek more recently published information about the program and its validity. If a program other than these nine is being considered, the teacher may apply the evaluation form described in this monograph. Evaluation of a program involves carefully reading the teacher's manual, examining the teaching materials, consulting other supportive evidence provided by the publisher, reading reviews of the program written by others, and locating and reading studies bearing on the effectiveness of the program in question. The evaluation form can be applied to any teaching program being considered for adoption by a school system. It is intended to help the evaluator determine whether the teaching program does in fact accomplish what it is supposed to accomplish. This is especially important when judging readiness programs, because the readiness skills are several steps removed from the academic skills, such as reading, whose development the programs are supposed to assist.

The programs reviewed here represent a sample intended as a cross-section of the many language and perceptual readiness programs available today. They range from sets of simple visual-motor and auditory discrimination tasks, to combinations of complex tasks, to tasks involving reception and production of language. The programs are designed to improve oral language or to encourage perceptual-motor development. Additional reviews of programs should be prepared and published so that information about teaching programs similar to the standardized test information found in the *Mental Measurements Yearbook* would be available for the use of school personnel.

• Preparation

Several reading specialists were invited to prepare reviews of readiness programs. The reading specialists and the programs they evaluated are: Carolyn Abey, Erie Program; Diane Bushner, Pictures and Patterns; Gloria Flaherty, Peabody Language Development Kit – Level 2; Jacquelin Gerth, Pathway School Program #1; Patricia Gromniak, Fairbanks-Robinson Program 1 – Level 1; Adele Hoffman, The Frostig Program for the Development of Visual Perception; and Mary Ruetenik, Auditory Discrimination in Depth. In addition, the writer prepared reviews of two programs – Perceptual Training Procedure and Developing Learning Readiness. These programs are a cross-section of perceptual and language programs ranging from simple perceptual tasks, to combinations of perceptual tasks, to complex perceptual and language tasks. An evaluation form was followed in the preparation of the reviews to assure that they would be thorough and that a standard system would be used for reporting information.

The review of each readiness program included in the monograph was sent to the program's senior author. Responses were received from Lloyd M. Dunn, senior author of the Peabody Language Development Kit; Charles H. Lindamood, senior author of Auditory Discrimination in Depth; Charles W. McQuarrie, Lions Research Foundation, writing about the Perceptual Training Procedure; G. N. Getman, author of the Pathway School Program and senior author of Developing Learning Readiness; Marianne Frostig, senior author of the Frostig Program and Pictures and Patterns; and Jean S. Fairbanks, senior author of the Fairbanks-Robinson Program. Although the senior author of the Erie Program did not respond, certain information specific to the program was obtained through a colleague who was in contact with Frank J. Pizzat, coauthor of the Erie Program.

Some authors pointed out factual errors in the reviews; others provided supplementary information about their programs. The writer then reexamined all of the teaching programs to be reviewed, studied the authors' comments, surveyed anew the literature on each program, and substantially rewrote the reviews stressing critical judgments.

Responses received from the authors of the programs helped to assure that the reviews, as rewritten, were accurate and that pertinent research was considered. Because of the general nature and provocativeness of Getman's remarks, especially his discussion of the whole idea of validation, they are appended to the reviews of his readiness programs in slightly abridged form.

In the final draft, research on the two Frostig programs was separated according to whether it was concerned with a developmental population, in which case the research is assigned to the review of Pictures and Patterns, or with a remedial or special population, in which case the research is assigned to the review of the Frostig Program for the Development of Visual Perception.

Chapter 2

PROGRAM EVALUATION

An evaluation form was used as a guide for preparing the reviews for this pamphlet. The form was adapted from Cronbach's form for evaluating tests (1), but in the course of preparing the monograph, several changes were made in the evaluation form. The reviews of the readiness program conform to the evaluation form as presented in this chapter.

The purpose of familiarizing the reader with the evaluation form is twofold: 1) the evaluation form enables the reader to read through the review of any of the nine readiness programs in which he is interested and to locate particular information about the program at a later time; and 2) the form will help the reader to evaluate any other teaching program by following the same procedures for locating the essential information for completing the form and making critical judgments about the adequacy of directions provided by the program, the design of the program, the program's validity, and the adequacy of the trial population and field testing procedures.

• Evaluation Form

The final evaluation form as applied to each of the nine programs consists of the following nineteen points. The reader should become familiar with the points and should try to understand the purpose of each.

1. Title
2. Author(s)
3. Publisher
4. Date of publication
5. General type
6. Purpose
7. Components
8. Description of items and activities
9. Basis for selecting items and activities
10. Adequacy of directions; training required to use the program
11. Mental functions or traits represented in the activities
12. Comments regarding design of the program (items 8 – 11, above)
13. Evidence of validity of the program (predictive, concurrent, other)
14. Comments regarding validity for particular purposes
15. Trial population (characteristics of population, normative performance, variability of performance, stability of performance)
16. Comments regarding trial population (adequacy of trial population, comments regarding performance)

17. Comments of reviewers
18. General evaluation
19. References

• Problems in Program Evaluation

A major problem in evaluating a readiness program is determining program validity, and this is discussed at length. A second problem arises out of the terminology employed in these programs. This chapter concludes with a brief discussion of the latter.

• Judging the Validity of a Readiness Program

The validity of a program is defined by the extent to which the program accomplishes its purpose. Some evidence should be provided by the publisher, but additional information accrues as the program is used, especially in controlled research studies. An evaluator's judgment of the degree of validity may have to be modified as more information becomes available. Judgments of the programs described in this publication are tentative, based only on the information available at the time the reviews were prepared.

In the course of judging the validity of the readiness programs a number of facts about them were considered. From these facts it is possible to suggest criteria to be applied when evaluating the validity of any readiness program. The criteria may be divided into two groups: 1) criteria for judging the validity of readiness skills identified, and 2) criteria for judging the validity of procedures used to implement the program.

Criteria for Judging the Validity of Readiness Skills Identified

1. There should be evidence that proficiency in the readiness skill identified in the program is correlated with achievement in an academic skill. For example, motor control has been found to be related to success in reading (*5*). However, though correlation between a readiness skill and an academic skill should be demonstrated, it is insufficient to establish the validity of the readiness program because two skills can be correlated without being causally related. The correlation between two skills can result from both being causally related to a third variable. In the example, motor control might not be causally related to success in reading; both might be causally related to physiological maturation.

2. There should be evidence that training given in the readiness program results in improvement of the readiness skill. For example, visual-motor training typically has resulted in improvement on visual-motor tests.

3. There should be evidence that the readiness skill would not develop sufficiently (to allow success in learning the academic skill) as a result of maturation or normal experiences of the children by the time the academic skill would be taught. The Developing Learning Readiness program and the Perceptual Training Procedure train the child to reproduce the diamond. With normal maturation a child will be able to draw this figure when seven years of age. This makes training of five- and six-year-olds a

questionable procedure. Developing Learning Readiness Program IV provides training in saccadic eye movements and ocular fixations. It is possible that normal day to day activities will provide children with sufficient training of this sort.

4. There should be evidence that improvement of the readiness skill, as a result of the training program, will actually contribute to later achievement in the academic skill. This may not occur if two skills are correlated but not causally related. The difficulty of demonstrating later achievement in the academic skill is illustrated by Pryzwansky's study (*4*).

Criteria for Judging the Validity of Procedures Used to Implement the Program

1. Provision should be made for distinguishing between children who already possess a skill and children who lack the skill.

2. Teaching should be directed to needed readiness skills, and not to a skill already mastered.

3. Teaching should not be directed to a skill that children would not normally possess until they are older. A readiness skill that is appropriate for children of a certain age may be inappropriate for younger children.

4. Provision should be made for evaluating progress in learning the skill in the course of the training program. It is indicated in the review of Developing Learning Readiness that the evaluation of skill development in Program IV, Eye Movement, appears not to be possible.

5. Training in the readiness skill should be related as nearly as possible to the ultimate academic skill. For example, visual discrimination training whose ultimate purpose is to facilitate letter discrimination should provide practice with the characteristic features that differentiate one letter from others. "Features which are actually distinctive for letters could be emphasized by presenting letters in contrasting pairs" (*2*).

6. The skills and knowledge being taught should be useful, and not merely an additional learning burden which may make the learning of the ultimate academic skill more difficult to attain. Auditory Discrimination in Depth may be criticized on these and related grounds. In addition to "teaching" the articulation of sounds which children may very well know, it teaches a series of descriptive phrases, such as "quiet lip-popper" or "noisy tip-tapper," for each speech sound. If the ultimate academic skill in this case is reading, the children must learn to associate these sounds with letter forms and these, in turn, with letter names. The descriptive phrases may be a superfluous learning burden, unless it can be shown that their use serves as a mediator that facilitates learning of the target associations.

• Terminology of Perceptual-Motor Learning

The terminology used to identify the perceptual-motor skills may be misleading. The term *perception* is often used to refer to perceptual-motor tasks which necessarily invoive encoding as well as decoding. Perceptual abilities, which are aspects of decoding, can be tested with discrimination tasks and possibly other means. But copying tasks, such as copying a diamond, may not measure perception at all. Errors in the drawing may indicate failure to encode despite adequate perception. Also, a form may

be copied correctly despite atypical perception; in such a case both the original form and the copy would be perceived in the same way.

Terms for specific visual perception abilities typically were borrowed from psychology. Sometimes their meanings underwent change when applied in education. Two terms whose meanings apparently changed are *constancy* and *figure-ground.* The visual perception ability originally identified as figure-ground is not evaluated in any of the perceptual-motor programs reviewed. The term is used in these programs, and in other educational writings, to refer to several abilities that may in fact be independent of one another; i. e., a child may be competent in one yet weak in another. This is discussed in some detail elsewhere (*3*).

• Summary

In this chapter the evaluation form and its purpose are discussed. The reader was advised to become familiar with each point in the form, and to try to understand its purpose before proceeding to the reviews of readiness programs.

The problem of determining program validity was discussed. The writer presented criteria for judging the validity of readiness skills identified, and for judging the validity of procedures used to implement the program.

Finally, the writer discussed the problem of interpreting the terminology associated with perceptual-motor training programs. Certain terms used in education do not have the same meaning as in psychology, the field from which they were borrowed. The terms were sometimes used with less precision by educational program developers; several independent skills were occasionally classified under the same term. With these points in mind, the reader will be able to examine readiness programs critically.

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4. Pryzwansky, Walter B. "Effects of Perceptual-motor Training and Manuscript Writing on Reading Readiness Skills in Kindergarten," *Journal of Educational Psychology,* 63 (1972), 110-115.
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Chapter 3

PEABODY LANGUAGE DEVELOPMENT KIT – LEVEL 2

1. *Title* Peabody Language Development Kit (PLDK) – Level ?

2. *Authors* Lloyd M. Dunn and James O. Smith.

3. *Publisher* American Guidance Service, Publishers Building, Circle Pines, Minnesota 55014.

4. *Date of publication* 1966.

5. *General type* Oral language development. The stress is an overall oral language development program rather than a program designed for teaching to strengths or to weaknesses. The program is designed for daily use within the classroom as an interlude from conventional schoolwork. It is intended to be part of, or to supplement the total language arts program; it is not intended to replace the regular curriculum in this area.

6. *Purpose* The Peabody Language Development Kits are designed for oral language stimulation. PLDK Level 2 is designed for children who are linguistically 6-8 years of age: second grade children from economically deprived areas of urban and rural communities, first grade children who are intellectually somewhat above average, mentally retarded pupils in intermediate grade special classes, or moderately retarded adolescents.

7. *Components* Kits are available at level P (mental age 3-5), Level 1 (mental age 4½-6½), Level 2 (mental age 6-8), and Level 3 (mental age 7½-9½). PLDK Level 2 is contained in a compact, sturdy, metal carrying case 12" x 8" x 11½." The components of Level 2 are:

a. A manual containing 180 detailed Daily Lessons, General Information and Directions, a description of the Research Development of the Kit, lists of materials, and the contents of the magnetic tape.
b. A set of 424 full color stimulus cards (7" x 9") arranged in several different categories, lithographed on triple-laminated stock to prevent seethrough, and coated with clear plastic for long life. The cards are in the following categories: Animal (birds, domestic, wild, insects); 2) Clothing (footwear, headwear); 3) Family; 4) Numbers in Color; 5) Occupation (professions, services, trades); 6) Shapes in Color; and 7) Tools.
c. A set of twelve I Wonder cards printed on plastic paper 18½" x 21½" in full color to stimulate imagination and continuity in story telling.
d. A set of 560 plastic color chips, 35 of each of 16 different colors, which interlock to allow chaining – used to teach the colors, sequencing, motor skills, and memory, as well as to reinforce learning.

e. Two soft hand puppets, Twinkle (the moon maid) and Whiskers (the raccoon) – used by the teacher and children alike to motivate the total group, especially withdrawn and distractible children.

f. A prerecorded tape containing 8 folktales told by a male speech model, and songs and music for the introduction and conclusion of Listening Time.

g. A Teletalk (transistorized battery-operated intercommunication set) used like a telephone set for stimulating oral communication.

Not included, but necessary for the presentation of the lessons, is a tape recorder that plays 3-3/4 inches per second, plus at least two clear tapes in addition to the prerecorded tape included in the kit.

8. *Description of items and activities* A total of 24 different types of activities are used in the kit. These are listed below along with the number of times each is used. Some units combine more than one activity which is multiply tabulated. Each lesson normally contains three of the activities. However, the number is increased or decreased where necessary to keep the length of the lessons approximately equal. The difficulty of the exercises for a particular activity was carefully sequenced from the beginning to the end of the year. Where possible, the day's activities were coordinated. However, the matter of scope, sequence, and theme within a lesson was considered secondary to graduating the difficulty of the item across lessons.

Table 1. Activities used in PLDK Level 2

Activity	*Number of Times Used*
Activity	42
Brainstorming	20
Classification	28
Conversation	28
Describing	18
Dramatization	17
Following Directions	34
Guessing	25
Imagination	26
Information	27
Listening	27
Looking	16
Memory	20
Pantomiming	15
Patterning	15
Reasoning	45
Relationships	37
Rhyming	21
Sentence Building	21
Speech Development	26
Speed-Up	18
Story	18
Touching	12
Vocabulary Building	31
Total	593

The activities require neither reading nor writing skills, and no seat work is involved. Most daily lessons contain an activity that allows free movement on the part of the group. All children participate at one time. The emphasis is on thinking, talking, and understanding speech through field tested activities which the authors consider to be highly motivating.

9. *Basis for selecting items and activities* Since the PLDK's are designed primarily to stimulate oral language development, the kits stress an overall oral language program, rather than specific training in selected psycholinguistic processes. Secondary goals are to improve intellectual functioning and enhance school progress. The major psycholinguistic processes trained by the lessons are the following:

Reception	*Conceptualization*	*Expression*
Auditory	Divergent Thinking	Vocal
Visual	Convergent Thinking	Vocal
Tactual	Associative Thinking	Motor

The program of instruction in the PLDK's is based on the model of psycholinguistic processes outlined above. Stressed in Level 2, as in other levels of the kits, is the training of global oral language rather than specific training on selected psycholinguistic processes. Emphasized are reception, expression, and conceptualization. The PLDK model drew on Osgood's linguistic theory which also formed the base for the Illinois Test of Psycholinguistic Abilities (ITPA). In addition, the work on creative thinking by Torrance was utilized in the thinking (brainstorming) area. Also, the theoretical model on the nature and training of human intellect by Guilford was drawn upon, especially in the areas of convergent (problem solving) and associative thinking (including memory).

The rationale for the kits is based on theory and research related to verbal learning and an attempt was made to cast the lessons in keeping with the behavior modification techniques of Skinner. Reinforcement was built in through the use of social reinforcement (praise) and concrete reinforcers (chips). Several procedures help maintain interest. Most of the daily lessons contain an activity which allows for free movement on the part of the group. Attractive full color pictures and devices such as the teletalk are used. Activities are paced to move on when interest lags. All children are engaged in all activities at all times. The kit includes only those elements which were found in field testing to be of high interest value to most children for whom this level of the kit was devised.

10. *Adequacy of directions; training required to use the program* Both the manual and the daily lesson plans are explicit and clear. The authors stated that no special training other than complete familiarity with the manual and kit are necessary for using the kit and that it can be used effectively by community volunteers as well as teachers. This appears to be true, with one addition: it is desirable for the teacher to be able to play the piano or xylophone.

11. *Mental functions or traits represented in the activities* The authors claim that the cognitive functions outlined in item 9 of this review are stimulated by the activities presented in the kit. The emphasis is on thinking, talking, and understanding speech through activities that are highly motivating.

12. *Comments regarding design of the program* The PLDK follows the guidelines set down by Aserlind (*1*) concerning exceptional children. Aserlind suggests that instructional materials should contain a number of intrinsic elements to enhance their effectiveness in the special class. Instructional materials, as far as possible, should make use of color, shape, or some other attention-getting facilities. They should be utilized in a meaningful fashion for capturing interest and presenting developmental concepts. Furthermore, he states that instructional materials should be relatively simple, as free as possible from perceptual and conceptual ambiguities and distortions, and be sequenced in short incremental steps. They should have either built-in or adaptive possibilities for some type of immediate meaningful reinforcement. They should take advantage of more than one learning receptor system, and should offer the opportunity to establish and maintain meaningful adult-child or teacher-learner interactions. The steps toward the acquisition of a concept or skill should be precisely identified. Instructional materials should be structured to insure that the learner achieves a sense of mastery; their format and design should be geared to the learner's chronological and social age; and the material itself should consistently take into consideration the physical, neurological, and emotional characteristics of the learner.

This reviewer finds that the activities presented in the PLDK Level 2 satisfy the guidelines set down by Aserlind. The activities should be satisfactory for children who are mentally retarded and for children with normal mental development. Aserlind warns, however, that the fact of teacher and pupil variability in acceptance of methods and materials will continue to make evaluation of the effectiveness of materials difficult. It is this reviewer's opinion that in the hands of a competent teacher, the use of the kit can encourage conceptualization and expression. The motivating techniques can be helpful. However, devices like chips, intended for reinforcement, can be used mechanically and without effect.

13. *Evidence of validity of the program* Studies concerned with language development programs in general and the PLDK in particular are summarized.

Carter (*2*) reported that it is possible to effect positive changes in the language age and mental age of culturally disadvantaged children through a short term small group language development program. Within its established framework, the school can work to reverse or arrest the progressive downward trend in language and mental abilities of deprived children. Carter studied two groups of 32 disadvantaged first grade children, with matched chronological age, mental age, language age, and sex. The experimental group received 40 daily 50-minute periods of language stimulation over a two-month period; controls were tested but received no treatment. At the end of the treatment period both groups were given a second test battery and gains in scores were noted. The experimental group gained significantly over the control group in mental age, IQ, and language age. There was no gain in the control group.

Mueller and Smith (*9*) reported that a three month period of language stimulation is not sufficient to make a lasting difference in the linguistic abilities of educable mentally retarded children. They suggest that further evidence is required to demonstrate the possibility of experimentally inducing lasting modifications of linguistic abilities. Since the experimental

group did show some tendency to score above the control group after one year, it might also be possible that a longer period of training could lead to lasting differences.

McConnell, Horton, and Smith (*8*) used the PLDK Preschool Level with the experimental groups in a three year study directed at the prevention of learning problems in school, the failure to achieve, and the subsequent school dropout. A daily program of language and sensory-perceptual instruction was provided to children enrolled in two community day care centers. Preliminary results from the first two years suggest significant gains in intellectual, linguistic, and perceptual functioning in comparison to control groups which did not undergo the same instruction but received many elements of traditional kindergarten-type programs.

Gibson (*7*) studied the effectiveness of PLDK Level 1 in improving the language ability of mentally retarded children, and reported that, although there was growth in the positive direction hypothesized, the difference between experimental and control groups, when the post test evaluation was controlled by its covariate pretest, was not significant.

Ensminger (*6*) studied the use of an experimental edition of the PLDK Primary Level with entire classes of primary age slow learners and borderline retarded children. He assessed the effects on language development and mental age over a seven-month period. He concluded that language development programs taught by classroom teachers may not result in significant enhancement of language ability of slow learning and borderline retarded children. Support was not obtained for the hypothesis that language development programing would significantly enhance the mental ages of slow learning and borderline retarded children. The usefulness of the language program (PLDK) in enhancing the language development of children with mental ages 4-7 was partially substantiated. The results suggested that differences among teachers may be an important variable to consider in planning language development programs for slow learning and borderline retarded children.

Dunn and others (*3*), in an interim report of a three year study of the effectiveness of the Initial Teaching Alphabet (i.t.a.) and the PLDK with underprivileged children in beginning reading and in stimulating oral language and verbal intelligence, reported: children with two years' instruction with both i.t.a. and PLDK made more reading progress than any other group; children with one or two years of PLDK made greater language gains than those without PLDK; and two years of PLDK produced a greater effect than one year of PLDK. The findings suggest that while use of i.t.a. made greater effects than conventional reading with or without PLDK, the combined i.t.a. and two years of PLDK was most effective with underprivileged children.

Dunn and Mueller (*4*) have reported that the language growth of culturally disadvantaged children was clearly enhanced by participation in a program utilizing the experimental version of the Level 1 PLDK over a one year period. Their testing tool was the ITPA; their experimental group made significant gains especially in the Vocal Encoding and Auditory Vocal subtests. These findings suggest that although the PLDK is intended to develop all language skills, it may be effective in teaching certain language skills but not others.

14. *Comments regarding validity for particular purposes* The following conclusions are based on the findings of the research cited above: 1) The PLDK may not be particularly effective with slow learners or educable mentally retarded students (*6, 7*); 2) the PLDK is more effective when employed over a period of at least one year; 3) the PLDK is more effective when employed as part of a total language development program; and 4) the PLDK appears to be effective with culturally disadvantaged children.

15. *Trial population* The manual describes the development of the PLDK as a group effort primarily utilizing the results obtained by field testers. The manual does not describe the population other than by stating the PLDK was used in Nashville, Tennessee, schools. It goes on to state that since 1965, when the experimental edition was assembled, two studies have used Level 2 of PLDK. These efforts at field testing before publication of the present PLDK provided the opportunity to improve the program.

16. *Comments regarding trial population* The description of the trial population given in the manual is less than adequate to indicate the characteristics of the children who can be expected to profit from the program. However, studies conducted by the senior author with an experimental edition justify using the program with disadvantaged children.

17. *Comments of reviewers* No specific reviews of the PLDK, other than the studies reported in this monograph, were located.

18. *General evaluation* The PLDK level 2 is designed as an oral language development program. The attractive and durable materials are packaged in their own container which occupies a minimum of space. The teacher should be familiar with the manual before using the program. The manual is clear and easy to understand. Ability to play the piano or xylophone is desirable but not necessary. The program is based on an adequate model of psycholinguistic processes, and the research suggests it does enhance the development of receptive, expressive, and conceptualization skills for certain populations when used for one or more years, especially as part of a total language arts program. School systems desiring language readiness programs may wish to consider adoption of the PLDK if examination of the kit suggests it will satisfy local needs.

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Chapter 4

AUDITORY DISCRIMINATION IN DEPTH

1. *Title* The ADD Program: Auditory Discrimination in Depth.

2. *Authors* Charles H. Lindamood and Patricia C. Lindamood.

3. *Publisher* Teaching Resources Corporation, An Educational Service of the New York Times, 100 Boylston Street, Boston, Massachusetts 02116.

4. *Date of Publication* 1969.

5. *General Type* A developmental program of auditory perception basic to reading, spelling, and speech skills.

6. *Purpose* The ADD Program is designed to teach beginning pupils, or older retarded readers, basic perceptual skills. In preschool and kindergarten the first two levels of the program are designed to bring awareness of the sound structure of the language to the children. For beginning readers, the complete program has the basic purpose of creating a base of auditory perceptual judgment. For slow learners or children with learning disabilities, it provides special help in establishing basic concepts, and provides some reinforcement material. Remedially, the purpose of the program is to develop the student's reading and spelling performance in relation to his level of oral language.

7. *Components* The kit includes materials for four to eight students. The materials are: Instructor's Guide, 7" record, 3 duplicator masters, 4 sets of 3/4" wooden blocks, 1 set of 4" felt squares, 1 set of 3" colored felt squares, 1 set of 4" pink felt squares, 1 set of 3" yellow felt squares, 4 sets of Mouth Form Flash Cards, 4 sets of Consonant and Vowel Symbol Cards, 4 Letter Symbol Tiles.

8. *Description of items and activities* The program is divided into four levels with material provided for each level. These levels are Gross, Oral-Aural, Sound Symbol, and Coding. The Instructor's Guide is structured in these four developmental levels. Each level is presented in the Guide with a summary of the purpose, a sample presentation for the class, and a series of developmental and reinforcement exercises for small group or individual use.

At the Gross Level, the child learns to discriminate between different sounds, to associate them with their source or formation, and to focus on other sounds. The child is introduced to the selective listening task and to the concept of how the ear functions as a monitor in discriminating between same and different sounds. There are four types of exercises at this level. Exercise 1, identification of environmental noise, consists of listening for and identifying familiar noises. Exercise 2, recognition of the moni-

toring function of the ear, consists of identifying examples of times that the ear recognized something or warned of such things as impending danger. Exercise 3, experience with focus-field shifts, consists of listening to two sounds at once and distinguishing one from the other. Exercise 4, experience in associating noises with the properties of the objects producing them, consists of identifying ordinary sounds such as an egg beater or scissor blades.

At the Oral-Aural Level, the child identifies and categorizes the individual consonant and vowel sounds through a discovery and labeling process, and learns to associate the feelings or movements of the sounds he makes. Consonants and vowels are grouped according to the similarities of their mouth formation and the sounds are given labels which can be associated with this function (eg., *p* and *b* are called lip poppers, *p* is a quiet lip popper and *b* is a noisy lip popper). These labels are used at subsequent levels as verbal mediators to help correct errors in color and symbol encoding and decoding.

The child is then led into a series of auditory discrimination exercises in which colored blocks are used to place order of sound. The use of these blocks enables him to make a visual representation of the shifts and changes in oral patterns. There is no constant relationship between color and sound, except to denote repetition of the same sound within a sequence. First the child is presented with isolated sounds in sequences of two or three same and different sounds. He then progresses to both simple and complex blends of sounds and syllables – making changes of sounds by removing, adding, or shifting blocks.

The authors of the ADD Program state that by associating these colored blocks with sounds, the child can begin to perceive the structure of auditory patterns. Later, this ability is expected to assist the child to conceptualize the relationship between the oral patterns and the graphic patterns that represent them, and to understand the logic of our reading and spelling system. The color encoding gives concrete form to an otherwise abstract task.

At the Sound Symbol Level, the child begins to associate graphic symbols to their sounds. This process can be overlapped with the previous tasks of discriminating consonant or vowel phonemes, or introduced as a separate concept. A series of exercises is used to develop an instant recall level for sounds and letters. In exercise 1, simple three-way association, the teacher gives a sound and the child shows the symbol; the teacher shows the symbol and the child gives the sound; the teacher gives the descriptive label and the child shows the symbol; the teacher shows the symbol and the child gives the label. In exercise 2, symbol-to-sound association, the teacher holds a symbol card close to her mouth as she pronounces a sound, giving both correct and error associations, and the child uses right-wrong cards to indicate his judgment of the teacher's association. In exercise 3, writing symbols, the teacher gives a sound, and the child writes the appropriate symbol with pencil and paper or with chalk.

The symbols are identified with the sounds which have already been established in the first two levels. These activities emphasize some of the basic reading skills, such as left-to-right orientation, position in space, starting and stopping points, order and sequence, and response to auditory and visual cues.

The final goal of the ADD Program is to develop facility with spelling and reading. At the Coding Level, the child now applies the encoding skills developed previously in the Oral-Aural Level and, in place of the colored blocks, uses letter symbol tiles and progresses to writing the patterns. In decoding, the child translates the printed written pattern into an oral pattern. Nonsense words are constructed with the symbol tiles. Finally, generalizations to real words follow.

9. *Basis for selecting items and activities* According to the authors of the ADD Program, "Reading and writing represent speech. A student who comes to realize this linkage and learns to associate written symbols with speech sounds is well on his way to becoming independent in reading and spelling" (*2*). This sums up the idea behind the development of the program. The authors believe that many children need basic work with words in this order: hearing sounds, labeling them, associating sounds and symbols, and converting speech patterns to graphic patterns and vice versa at the syllable level.

The authors report that many persons are unable to perceive accurately or conceptualize sequences of speech sounds, and so are unable to relate the oral pattern to the printed word with the necessary precision for reading and spelling competency. They believe the key to assisting students with the task of associating letter names, forms, and sounds, and the integration of this knowledge in reading and spelling activities lies in getting all modalities involved in the task and involving them as early as possible. A student's ease in becoming an independent reader will be related to his auditory-perceptual judgment. Auditory-perceptual judgment is defined as the student's ability to recognize the correspondence between the contrasts, sequences, and shifts in our oral patterns and the graphic patterns we use to represent them.

By use of the sound labels, the ADD Program is designed to develop the ability to discriminate likenesses and differences between speech sounds, individually and in sequence. The activities in which the blocks are used were selected to develop perception of the order of sounds in sequences and the shifts and changes of sounds within patterns.

Ordinarily in learning to read, the process goes from spelling system to sound pattern. The ADD Program's approach is to work from sound system to spelling and reading by giving experience with phonological structure and then moving to the symbol system which we use to represent these contrasts.

10. *Adequacy of directions; training required to use the program* The Instructor's Guide is the principal element of the program. The background which it provides concerning the concepts developed by the ADD Program and their application to remedial reading is excellent. The instructions are specific, but, because of the knowledge which is required concerning labeling of sounds, it is necessary for the teacher to study them thoroughly. A record that accompanies the text should help the teacher to learn the sound labels. The materials which accompany the program are well made, but most of them could be improvised by the teacher. However, improvising materials could be very time-consuming and certain materials could not be easily improvised. In conclusion, the Instructor's Guide and the remaining materials are prepared carefully and should

enable the teacher to learn and carry out the program without undue difficulty.

11. *Mental functions or traits represented in the activities* The mental functions represented at the Gross Level are problem solving techniques, awareness of learning, interest in sounds, and selective listening. At the Oral-Aural Level, the functions represented are auditory discrimination of speech sounds and perception of their patterns of occurrence, and relationship of contrasts in the phonological system. At the Sound Symbol Level, the function represented is the identification of graphic symbols and their phonemic values. Represented at the Coding Level are encoding of speech patterns into graphic patterns, decoding of graphic patterns into speech patterns, and generalization of words.

12. *Comments regarding design of the program* In the reviewer's opinion, the exercises at the Gross Level can contribute to listening skill development, particularly the attentional aspect of listening. The activities at the Oral-Aural Level are adequate for teaching children about sound production and to associate speech sounds with descriptive labels. The use of colored blocks to represent sound sequences is an explicit way of relating temporal patterns in speech with spatial arrangements in writing. Activities at the Sound Symbol and Coding Levels are also thorough and explicit in teaching letter-sound relations and basic spelling patterns. Support for explicit development of reading subskills can be found in Silberman (5), who in analyzing the revisions made during the development of a first grade phonics program, suggests that 1) pupils may not easily generalize to letter-sound relationships without explicit development of these subskills, 2) special practice has to be given in making transfer to novel words before students are able to read new words, and 3) direct teacher-pupil contact may be preferable to instruction via audiotape. Silberman's recommendations support the detailed sequencing of skills found in the ADD Program.

One criticism of the program in its present form pertains to the use of descriptive labels. It can be asked whether having all children learn the descriptive labels of all sounds does not become an unneeded memory burden much of the time, even when helpful as a verbal mediator on occasion.

The broadest criticism of the ADD Program is based on the argument of linguists like Bloomfield (*1*) that children already know the sounds of the language if they can speak and understand the language. Since this is so, instruction in the manner of articulating sounds, and the accompanying use of descriptive labels of sounds for this purpose, should be unnecessary unless the child has a problem with the articulation of certain sounds. Furthermore, the argument would go, children's knowledge of speech sounds was acquired by hearing and producing sounds within words; when learning to read they should again encounter speech sounds within familiar words, not in isolation. If this were done, special training on making isolated sounds would be unnecessary. The decision to use descriptive labels of speech sounds as verbal mediators between letters and sounds may merely result from the fact that the ADD Program teaches isolated sounds, rather than sounds within word environments which, in turn, are within meaningful sentence context.

13. *Evidence of validity of the program* A study of Lindamood (*4*) supports use of the ADD Program in a public school setting. Lindamood and Lindamood (*3*) report that thirty-six children in grades one to eight, selected for instruction with ADD, appeared to make appreciable gains in oral reading and auditory conceptualization. The reviewer is aware of no other research on the effectiveness of the ADD Program.

14. *Comments regarding validity for particular purposes* Empirical evidence on program effectiveness is quite sparse; the total number of pupils involved is still quite small. Information contained in one report (*3*) seems incomplete, and errors apparently were made in the design of the study. At present, there is too little evidence on the program's effectiveness to permit any firm conclusions. It is to be hoped that more evidence will be forthcoming.

15. *Trial population* The ADD Program was pilot tested with children of varying ethnic, cultural, and academic backgrounds at the Lucia Mar Unified School District, Pismo Beach, California; the Mid-Missouri Mental Health Center School; and school districts of Oahu, Hawaii. No information concerning typical performance or variability of achievement of this trial population is available from the publisher.

16. *Comments regarding trial population* Apparently the program was tried with a large and varied population. Lack of performance data is unfortunate.

17. *Comments of reviewers* No reviews were found.

18. *General evaluation* The Instructor's Guide does an adequate job of explaining the underlying concepts of the program and providing directions for teaching with it. Findings of related research (*5*) and evidence of program validity (*3, 4*) offer some support for using the program to develop auditory perception and reading skills. Questions could be raised concerning some of the specific techniques; e.g., whether children require speech instruction as preparation for reading and whether the use of descriptive labels is helpful or merely increases the learning load.

The reviewer believes the use of the blocks to isolate sound variables will be helpful. Using this program may be helpful in those cases where specific disabilities are diagnosed in phonics or other aspects of auditory perception detailed under section 8 of this review.

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Chapter 5

PERCEPTUAL TRAINING PROCEDURE

1. *Title* Perceptual Training Procedure for Beginning School Children.

2. *Author* Winter Haven Lions Research Foundation.

3. *Publisher* Winter Haven Lions Research Foundation, Box 1?1, Winter Haven, Florida 33880.

4. *Date of publication* Procedure Manual published in 1963.

5. *General type* Perceptual-motor training for children ages five, six, and seven.

6. *Purpose* Perceptual Training Procedure for Beginning School Children is intended to help children who are "perceptually disturbed," or who lack the necessary degree of hand-eye coordination for beginning school tasks, "to achieve a greater degree of success than if they had been permitted to enter formal reading instruction without it" (5).

7. *Components* The Training Procedure may be used with or without prior testing with the Perceptual Forms Test, also published by the Winter Haven Lions Research Foundation. Both the test and the Training Procedure are described in the Procedure Manual.

Other materials for the test are a pad of Incomplete Perceptual Forms for pupils' responses and the Group Testing Targets.

Other materials for the training program are master templates, each having five forms (circle, square, triangle, rectangle, and diamond); and a set of large single form templates.

8. *Description of items and activities* The training program consists of the indoctrination session, in which the pupils copy the forms in the air using pencils and master templates. They are then to copy the forms on paper without using the template, except for looking at the forms. This provides a record of initial copying before form training begins.

From the second session, each pupil 1) traces each form using the master template with instructions to keep the pencil point on the paper and to bump each corner (except for the circle), 2) traces over the work sample without the template with instructions to stay on the line, 3) draws the five forms with no visual model with instructions to make the forms the same size and in the same position as before, and 4) traces the forms from the template onto the paper with the free-hand drawings to compare how closely the drawings match the forms. When adequate ability to deal with the forms is attained, the children are asked to make pictures from the basic forms by adding several lines.

9. *Basis for selecting items and activities* The tasks in the Training Procedure include those in the Perceptual Forms Test. Apparently, the authors believe that by teaching the test the skills tested could be improved and the effect of this improvement would be more general than performance merely on copying the five forms on the test. Selection of these five forms for the test seems to have been made on the basis of developmental studies which indicated at which chronological ages children developed competence in reproducing certain forms.

10. *Adequacy of directions; training required to use the program* Directions in the Procedure Manual are complete and easy to follow. Teachers should be able to use the Training Procedure without special training.

11. *Mental functions or traits represented in the activities* The authors intend that the program develop the following abilities: copying, matching, size constancy (ability to reproduce forms so the relation of overall size to the model is maintained), visual memory, eye-hand-motor performance, visualization (changing the basic form into pictures by adding a few lines).

12. *Comments regarding design of the program* Training in drawing five geometrical shapes appears to this reviewer to be a rather narrow basis for developing the abilities listed in the preceding paragraph. While these particular shapes are satisfactory for inclusion in a training program that addresses itself to these abilities, and may even be sufficient for a test that samples these abilities, the training program should include a greater variety of tasks.

13. *Evidence of validity of the program* The criterion of validity of this program is success in general school achievement, particularly reading. The validation studies on the Perceptual Forms Test found test performance was correlated with school achievement in primary grades. In studies on the use of templates in a perceptual-motor training program, the hypothesis tested was ". . . training (with the aid of templates) in reproduction and better perception of these forms might contribute to better school achievement" (*5*).

The perceptual training program was field tested over a three year period. Too few final data were obtained at the conclusion of the first year (1959-1960) to permit evaluation. Of eight first grade classes in the 1960-1961 study, results on only four of the eight could be evaluated. These results supported the hypothesis that perceptual-motor training contributed to school achievement. Very few differences between experimental and control groups were obtained in the 1961-1962 research. Experimental groups, however, got a later start on formal reading instruction than did control groups (*5*).

DiMeo (*2*) reports a significant relation between achievement in a word discrimination test and certain measures of perception. This was further support for the use of the Perceptual Forms Test as a predictor of school achievement. Bosworth (*1*) found that the teaching of visual-motor skills resulted in higher performance both on a visual-motor test and on a test of word discrimination.

14. *Comments regarding validity for particular purposes* The reports of the field testing (*5*) offer slight support for employing the Training

Procedure to improve school achievement. Bosworth's study (*1*) offers additional support. Additional research is needed to judge the degree of validity of the Perceptual Training Procedure and the magnitude of the contribution to school achievement that may be expected.

On the Stanford-Binet, drawing a circle is placed at year three, the square at year five, but the diamond is placed at year seven (*6*). If these are considered standards of normal achievement, the fact that drawing the diamond is at year seven leads one to question the appropriateness of expecting that typical first graders be able to draw that figure.

15. *Trial population* The trial population consisted of first grade classes, evidently of one school system, over a three year period. The manual provides little information about mean performance and variability and stability of performance in the training program.

16. *Comments regarding trial population* Besides the need for additional research for purposes of validating the program, further studies should provide descriptions of typical learning performance, variability of performance among subjects, and stability of performance. The present research data lacks this information about the trial population.

17. *Comments of reviewers* No other reviews were located.

18. *General evaluation* The Training Procedure focuses on too narrow a range of tasks for a program that intends to teach such skills as matching and visual memory. In effect, the Procedure teaches the Perceptual Forms Test. If the test is intended to sample a larger spectrum of tasks than the drawing of five forms, use of the Training Procedure must invalidate the test. If the desired goal is the drawing of five forms, it remains to be shown that these forms are of any greater value than other perceptuomotor tasks. Additional research is needed to demonstrate to what extent improving one's ability to draw these five forms contributes to academic achievement. What can be said at present is that the Training Procedure helps to improve a child's skill at drawing five geometric forms and makes a contribution to word discrimination ability.

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5. *Procedure Manual.* Winter Haven Lions Research Foundation, 1963, 2-3, 4-7, 14.
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Chapter 6

DEVELOPING LEARNING READINESS

1. *Title* Developing Learning Readiness.

2. *Authors* G. N. Getman, Elmer R. Kane, Marvin R. Halgren, and Gordon W. McKee.

3. *Publisher* McGraw-Hill, Manchester Road, Manchester, Missouri 63011.

4. *Date of publication* 1968.

5. *General type* Perceptual-motor training.

6. *Purpose* The program may be used with kindergarten and first graders. The purpose is to develop general coordination, balance, eye-hand coordination, eye movement, form recognition, and visual memory.

7. *Components* The Developing Learning Readiness program consists of a teacher's manual, Targets, Space Masks, Space Sighters, 15 filmstrips, Melvin models for teacher and children, Webstermasters with teacher's guide, five sets of desk templates, five sets of chalkboard templates, and a set of three eye movement charts. A balance board is needed also but not provided.

8. *Description of items and activities*

   a. Movable Melvin is used in conjunction with the Introductory Program and Program I, General Coordination. Activities include head movements, bilateral actions (arm and leg movements), alternating actions, body movements away from the floor.
   b. Program II, Balance, consists of balance board activities that include Indian walk, backward walk, stepping off distances, walking abreast of peripheral targets.
   c. Program III, Eye-Hand Coordination activities include drawing bilateral circles (both hands) on chalkboard, bilateral horizontal lines, bilateral vertical lines, diagonal lines in varied directions to connect Xs.
   d. Program IV, Eye Movement, includes activities for practicing saccadic eye movements (changing fixation from one point to another), ocular fixations at varying distances from near to far, locating objects in the classroom, and eye pursuit movements (following a moving target).
   e. Program V, Templates activities include tracing, with templates, five forms (circle, square, triangle, rectangle, diamond); tracing free-hand over the drawings first made with the template; and drawing the forms from memory.

f. Program VI, Visual Memory activities include 1) Use of filmstrips with which forms are presented under timed exposure conditions. This procedure includes having children "name it," "trace it in the air," "circle it on your paper," "trace over it on the worksheet," and "make one like you saw." 2) Matching double forms for both shape and sequence, using worksheets and tachistoscope. 3) Matching forms within forms and drawing these from memory. 4) Matching and drawing solids with segmented forms. 5) From memory, drawing forms onto the correct position of a Tic-Tac-Toe frame. 6) Recognizing forms from incomplete patterns. 7) Recognizing double forms from incomplete patterns.

9. *Basis for selecting items and activities* The authors state that the program is designed to promote development of four learning arts: movement, orientation, identification, and communication. The visual aspect of these four areas is emphasized.

10. *Adequacy of directions; training required to use the program* The directions in the teacher's manual are very clear and complete. It should be possible to administer the program without special training.

11. *Mental functions or traits represented in the activities*

a. The Introductory Program and Program I are designed to establish a better body image, a more complete scheme of body action, and improved motor coordination.
b. Program II is intended to interrelate combinations of movements and develop visual steering.
c. Program III is intended to develop eye-hand coordination.
d. Program IV is intended to help develop the skills of ocular fixation, visual scanning, and ocular sweep.
e. Program V is intended to develop abilities to perceive forms, learn special hand movements, integrate eye-hand action and visual-tactual-kinesthetic information, and learn visual discriminations of figure-ground relationships.
f. Program VI is intended to develop recall and visualization of previous experiences.

12. *Comments regarding design of the program* The specific activities enumerated in section 8 appear to be reasonable derivatives of the particular traits in section 11 identified by the authors as objectives of the training program. The program (perhaps proceeding on the assumption that all children require all activities) fails to provide a means for identifying and selecting children requiring training in a particular skill. This reviewer finds it difficult to imagine that all children require the vision training provided in Program IV. Furthermore, progress made in learning a skill cannot be evaluated in all programs (e.g., Program IV) and the teacher would have no way of knowing that the children failed to learn the skill.

13. *Evidence of validity of the program* The manual contains no references to research on the program and none were found in a survey of the literature. The publisher furnished the reviewer with a summary of one unpublished pilot study. This study (*2*) was conducted in one first grade class (N = 30) which received a fifteen week program with an earlier ver-

sion of DLR during the second half of the school year. This class was compared to three first grade control classes. The experimental group surpassed the control groups in reading performance, and the investigators concluded that the higher level of readiness contributed to academic performance.

Program V is so similar to the Perceptual Training Procedure for Beginning School Children, reviewed in the preceding chapter, that the research findings on the latter may be applied to Program V. The reader should consult sections 13 and 14 in the review of the Perceptual Training Procedure for a discussion of its validity.

14. *Comments regarding validity for particular purposes* Unlike the Perceptual Training Procedure, which is similar to Program V alone, Developing Learning Readiness is a broadly based program of visual-motor training. Available evidence does not demonstrate which of the several visual-motor skills improve as a result of the training program. It seems to this reviewer that improvement in such skills as balancing would result from a training program. However, this reviewer questions whether fixation training, as done in Program IV, would lead to any more improvement than that provided by the normal day to day activities of children.

Since this is a readiness program, there should also be evidence that improvement in visual-motor skills contributes to school achievement. Only one study indicates that the program may contribute to later reading achievement. This finding should be verified with additional research. The limited evidence of validity has not prevented the authors from making statements such as the following (*1*): "Peripheral vision extension and eye pursuit movements prepare for some of the very demands a primer makes upon children when they begin to learn to read. . . . Children learn to distinguish left from right, and by turning their Templates, they learn to distinguish the form in all of its planes. This helps then, in their reading, to distinguish *b* from *d*, *p* from *q*, etc." Statements of this type are common in the manual. Further research is necessary to show which visual-motor skills improve as a result of training and what effect improvement in these skills has on reading and other school achievements, especially since many children may develop the necessary stage of readiness with just their normal activities.

15. 16. *Trial population, comments* The manual contains no information on field testing or trial populations. An unpublished study was limited to first grade children in a Minneapolis suburb whose ability level was above national norms.

17. *Comments of reviewers* No reviews were located.

18. *General evaluation* Developing Learning Readiness can be used by teachers without special training. In some instances it would not be possible to tell whether the children require the training provided, nor would it be possible to evaluate their learning. The limited validation research makes it impossible to say which aspects of the program make any contribution to reading readiness and later school achievement.

References

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2. "The Physiology of Readiness Experiment," unpublished paper.

Response by G. N. Getman

The review of the program Developing Learning Readiness is very concise and appropriate through point 11. There are some comments necessary about points 12 through 18 and I feel it best to take these points one at a time.

Point 12. *Comments regarding the design of the program*

This program does proceed upon the assumption that all children can be better and more ready than they are when they arrive at the schoolhouse door at five or six years of age. There can be no doubt that some children are lacking in readiness, but the authors of this program are convinced, by many years of clinical study of children, that every child can achieve greater skills with guidance and supervision than he does in a completely free and happenstance preschool life. Almost every teacher with any degree of experience can quickly tell which children need more help in getting ready, and which children are doing well enough to meet the standards of pretty minimal performance we are now requiring of children to "pass" sandbox and fingerpainting.

This is especially true in the area of visual readiness. It is very important to return to the introduction, and carefully reread the three last paragraphs on page 2 of the Teacher Manual. Here the strong point is made that vision is the ability to interpret what is seen – to discriminate and appreciate the differences that count. It is clinically accurate to say that no child reaches the classroom for the first time with the skills he needs for academic task demands, nor does he have the skills he can have with guided practice. We can flatly and dogmatically insist that every child can do better than he does in this area of perceptual development, and that no child should be deprived of the opportunity to gain this added readiness for the visual tasks that lie ahead of him.

Again, it is difficult for us to imagine that teachers who have had any experience with children will not recognize the child who cannot successfully complete the tasks that are put before the child; make judgments of the quality of the performance of the successful child; and know which child needs more assistance in developing readinesses for the tasks ahead. Literally hundreds of teachers are now reporting to us that these procedures, and the instructions as given, have alerted them to what they should be looking for, and as a result, they are now making appraisals of performance they were not aware of before this program was introduced.

Point 13. *Evidence of validity of the program*

There is no reference to research in this area of readiness development because the authors have not been able to find any such program described in the literature. The assumption has been made by the authors that a higher level of readiness – those qualities described in the Introduction as the arts of movement, orientation, identification, and communication – will contribute to more adequate levels of academic performance because of all the studies and research in the field of child development that also would lead one to these same assumptions. Again, the reports now coming from teachers using the program begin to substantiate this assumption. It

must be very clearly pointed out here that this program will not and cannot guarantee academic success. It can only assist the child to approach a readiness that makes him more available to the teacher, who will then have the responsibility of introducing the child to all the abstractions inherent in academic programs where these abstractions must come to represent reality. The first purpose of readiness is to give the child the background frame of reference which comes from primary experience and which the child can then refer to in the very complex process of understanding the abstractions.

Again, since this was the first of the programs of this type ever introduced (previously introduced in 1964 as The Physiology of Readiness Program, PASS, Minneapolis), the "validations" of it are just now being achieved. The fact remains, however, that the entire program is validly and securely based upon sound principles of child development already established by a large number of investigators.

Point 14. *Comments regarding validity for particular purposes*

One of the pleas of this entire program is that we cease to appraise a child as a package of separate and unrelated skills, and that we begin to see each child as a composite of all of the world about him. There certainly is no attempt to improve all the skills that can make him more available to the good teacher. One wonders how much evidence is required that visual-motor skills are related to school achievement. Some of the very best research on this point was done by Helen Robinson and reported in *Supplementary Educational Monographs,* Number 77, January 1953. This is entitled "Clinical Studies in Reading II," and points up the need for teaming, control of mobility, and the significance of two eyes as a very closely related pair.

The reader is also referred to much of the recent literature on perception, and the importance of visually directed and appraised movement for the basic development of perception. We sincerely regret that the bibliography which appeared in the original publication (*The Physiology of Readiness*) was not included by the present publishers. . . . This extensive background of literature has moved the authors to make statements they know to be clinically valid and verifiable by a thorough search of the literature on child development, perception, and reading. All of this shows that normal childhood activities are less and less adequate as training grounds for the skills demanded in the classrooms. The extensive literature and research on TV and its influence presently makes this point.

Points 15, 16, and 17. *Trial population, comments*

Once again, the authors admit there was practically no field testing because this was the first of such programs, and the field testing had to occur by its very use and application. It is interesting, even though it is not statistically significant, that the children in the Minneapolis suburb who did benefit from the program were children already considered to be "readier" than the national average. The authors would be more than delighted if the present publishers (McGraw-Hill, Webster Division) would assume their rightful responsibility to gather up-to-date information on the program, since they are the only ones who know where the units are being most widely used.

Point 18. *General evaluation*

Perhaps this point has already been covered by the previous comments. Only one additional reaction seems appropriate. Perhaps we need to take an entirely new and unbiased look at what we are calling readiness for reading. Is there a very real possibility that the skills critical to success in reading are quite different from those we have been considering? In this regard, perhaps we must look at and work with the total child instead of merely giving lip-service to this cliche and then continuing to deal with the child piece by piece. After seven years of casually following the use of this program, and the results being reported, it is important to once again state that this is a program designed and fully intended to bring into the academic classroom children who are more available to the teacher. This program will not guarantee direct and immediate classroom achievement – this still falls under the influence of the teacher who must help the child translate his world into symbols. There can be very little doubt, either clinically or logically, about the potential for success in the classroom if the child brings greater skills of worldly awareness with him when the teacher introduces him to the translations he must make. Under these circumstances, we will not perseveratively attempt to find *a program*, or even *an aspect of a program* that holds the magic key. We will assist the child with programs that help him to bring all of himself into the classroom with greater skill and readiness than he will acquire in a happenstance, lucky occurrence sort of preschool existence.

The authors are fully convinced that all children can be better than they are under the present procedures of minimum requirements for "passing." It seems a critical time to give all children the opportunities to gain even more skills than those that will let them get by within the standards we are now setting as "national averages," which then become goals that are undoubtedly far below the children's potentials.

Chapter 7

PATHWAY SCHOOL PROGRAM

1. *Title* Pathway School Program: Eye Hand Coordination Exercises.

2. *Author* G. N. Getman.

3. *Publisher* Teaching Resources Corporation, An Educational Service of the New York Times, 100 Boylston Street, Boston, Massachusetts 02116.

4. *Date of publication* 1968.

5. *General type* Designed to help improve a child's eye-hand coordination.

6. *Purpose* This program is designed to develop visual-tactual integration; specifically it is for use with children of nursery school, kindergarten, and primary level performance. It is particularly designed to assist children with learning disabilities in acquiring skills of discrimination and dexterity necessary for eye-hand coordination.

7. *Components* The Pathway School Program consists of an Instructor's Guide and the following equipment: a wooden plaque to be mounted on the wall; a wooden support rod, which is screwed into a threaded hole in the plaque when the apparatus is used; a ball fixed to a cord, having a fastening pin which is suspended from the support rod; two bats, similar in shape to small rolling pins, with painted stripes on them; a target with colored lines printed on it.

8. *Description of items and activities* The equipment is to be set up in the specific manner outlined in the guide. There are seventeen procedures and several additional exercises in the program. The specific instructions for each are given in the guide. The sequence of procedures has been carefully planned so that the more basic and developmentally critical procedures are presented first. All of the procedures consist of hitting the ball with the bat in some way.

9. *Basis for selecting items and activities* The program is intended as a planned sequence of exercises for developing eye-hand coordination. The sequence is planned to go from the more basic and developmentally critical to the more complex visual-motor skills. The program is an attempt to involve and begin to integrate the skeletal and muscle systems in a goal-directed activity.

10. *Adequacy of directions; training required to use the program* The Instructor's Guide provides precise and clear directions for each of the procedures and the follow-up exercises. They are simple enough so that children may demonstrate each new procedure to one another.

11. *Mental functions or traits represented in the activities* The following skills are developed according to the child's needs: skills of eyes steering hands and hands performing a task visually appraised; skills of postural, arm, hand, and eye movements in unison; basic eye-hand combinations; awareness of various relationships; movement of arms and hands at right angles; flexibility; estimation and control of the results of sensorimotor actions; control of the degree and amount of thrust employed; appreciation of geometrics of space; shifting of visual attention to see all of the movements and relationships; use of color in making judgments about targets; control of ball and the direction of its arc; ability to stop and change direction; following directions.

12. *Comments regarding design of the program* The author of the Pathway School Program considers the skills that are developed to be related to academic goals, and stresses the importance of following the procedures in order, so as to develop each skill. The program stresses fundamental skills often taken for granted. While the visuomotor skills and academic achievement may be related, the importance of training in eye-hand coordination for attaining academic goals may be over emphasized.

13. *Evidence of validity of the program* No evidence was presented to show validation of the program. The author states (*1*), "The program has been successfully used with many children in the primary grades and has proved of great value in helping them develop their basic learning tools."

14. *Comments regarding validity for particular purposes* The area of validation needs to be studied and reported upon. It appears likely that there is some correlation between the visuomotor skills developed and the academic goals stressed. The contribution to attaining academic abilities by training given in the Pathway School Program has yet to be demonstrated.

15. *Trial population* The program was developed and used at the Pathway School, Norristown, Pennsylvania, for use with children of nursery school, kindergarten, and primary levels of performance, not chronological age.

16. *Comments regarding trial population* The description of the trial population provided in the Instructor's Guide is inadequate. Further information on the population and descriptions of performance is desirable.

17. *Comments of reviewers* Sheldon R. Rappaport, in his preface to the Instructor's Guide, finds the program unique in its simplicity. Rappaport reports that during trial use of the program, ". . . teachers improved in their astuteness of observation, in their ability to understand the child's performance in all learning situations, and in their appreciation both of the child's current development level and of the steps needed to foster further development" (*1*).

18. *General evaluation* The program gives too much emphasis to the area of eye-hand coordination and its developmental process in relation to the whole child. Although the author states this is not the panacea to the problems of sensorimotor dysfunction, much stress is given to the correlation of motor skills and academic achievement. Although correlation between the two is likely, its importance may be exaggerated. Further infor-

mation with respect to trial population and program validity should be provided by the publisher.

Reference

1. Getman, G. N. *Instructor's Guide: Pathway School Program.* Boston: Teaching Resources Corporation, 1968.

Response by G. N. Getman

Much of what has already been written by this responder is applicable to both programs (Developing Learning Readiness and Pathway School Program, Chapters VI and VII of this monograph). One or two points are all that need any further reaction.

Point 13. *Evidence of validity of the program*

Once again, it appears as if a program must pile up a huge sum of statistics before it can be considered a valid program. If only we can look very carefully at what it is we expect children to be able to do, as well as what we expect them to know (by some sort of osmosis, or contagion) it is not very difficult to conclude that practice in the use and application of the eye-hand team is most likely to be of benefit to a child who must spend his school life time in tasks that also demand teaming of eyes and hands. What sort of validity should we search for in any attempt to design programs for children that will guide them in the use of the learning equipment (such as eyes and hands) they bring with them? Reports coming from a large number of teachers who are now making this program available to young children strongly indicate that these children make better use of eyes and hands for such tasks as handwriting, crafts, coloring, cutting, and pasting. Is it safe to assume that these tasks are statistically valid and appropriate for children facing academic tasks? If so, then any eye-hand coordination program is also valid.

Point 14. *Comments regarding validity for particular purposes*

Here again, we need to carefully establish what it is that will determine the validity of this program. It is certainly time we begin to ask what skills are important to the entire learning process, instead of continuing to attempt to isolate areas for validation.

Point 18. *General evaluation*

The comments here make the very point that I have been trying to make in all of my responses. How can there be "too much emphasis to the area of eye-hand coordination" when every individual's lifetime involves hands as the primary performance system, and involves the visual system as the primary guidance system for this performance? Much stress is given to eye-hand coordination and academic achievement because of the analy-

sis of every task put before a child in every classroom – and the overwhelming emphasis upon eye-hand coordination . . . without which a child could not possibly succeed in the programs. . . .

I think it is very important that we establish what we really mean by validation. Just because a program does not immediately bring a rise in academic performance (according to some criteria which may also need reevaluation) does not mean that this program is not beneficial to the physiological, developmental, and intellectual performance of the child. If a program contributes to the physiological and developmental growth of a child, and is logically and conceptually sound according to all the studies that have been made outside of academia, then it is very realistic to assume such a program can contribute to the child's readiness for the programs that education will present inside academia. In thirty years of study and clinical experience, I have never seen a program that was developmentally sound that was not also academically sound.

Put all programs to the following test: What question does this program ask of the child using it? Is this question, and its answer by the child, a practice in the skills of discrimination and performance that are also used by the child in all other learning situations? I am very confident that if there is developmental, physiological, and intellectual value in any program, it will then be a valid program for the development of readiness in children.

Chapter 8

FROSTIG PROGRAM FOR THE DEVELOPMENT OF VISUAL PERCEPTION

1. *Title* The Frostig Program for the Development of Visual Perception.

2. *Authors* Marianne Frostig and David Horne.

3. *Publisher* Follett, 1010 W. Washington Boulevard, Chicago, Illinois 60607.

4. *Dates of publication* 1964, 1968.

5. *General type* Perceptual skills and visual-motor activities.

6. *Purpose* For training visual perception for all children in kindergarten and in first grade; for use as a remedial program for children of any grade level whose visual perceptual development has been impaired.

7. *Components* Teacher's Guide, program materials available in a Specimen Set, Individual Set, and in a Frostig Program Box containing master stencils each of which can produce 300 to 400 copies. The worksheets cover five areas of visual perception.

8. *Description of items and activities* The development of the Frostig programs went through three phases. First there was the Frostig Developmental Test of Visual Perception (FDTVP). Out of this test grew The Frostig Program for the Development of Visual Perception (Frostig Program). Although intended as a remedial program, it has also been used as a developmental program with all children at a given grade level. Finally came the three part developmental program called Pictures and Patterns. The Frostig Program is reviewed in this chapter. Pictures and Patterns is reviewed in Chapter 9. Since the two programs are quite similar, research with general (developmental) populations, whether employing the Frostig Program or Pictures and Patterns, is discussed in Chapter 9, Section 13 along with predictive studies on the FDTVP. Studies concerned with the use of the Frostig Program with remedial, disadvantaged, and special (e.g., mentally retarded) populations are considered in Section 13 of this review.

The Frostig Program for the Development of Visual Perception is administered by using the Teacher's Guide and the worksheets. Before using the worksheets, preparatory training, as outlined in the Guide, is introduced and is continued throughout in conjunction with worksheets. Body image exercises is the first kind of training to be used. This is to be followed by a physical education program (*4*).

Instructions for using the worksheets are contained in the Teacher's Guide. The worksheets cover five areas of visual-perceptual ability. In the Program Box published in 1968, the worksheets in each visual perception

area are divided into three levels of difficulty, designated Levels 1, 2, and 3 by the publisher.

The preparatory exercises and worksheets in each of the five areas of visual-perceptual ability are summarized below. In general, the exercises precede introduction of the worksheets in each area. Within each area the set of worksheets progresses from easy to difficult.

The five areas, showing the types of exercises and worksheets in each, are as follows:

a. *Visual-motor coordination.* EXERCISES: 1) eye-movement exercises – left-right progression, peripheral vision, focusing eyes with head in motion and when stationary, following regular movements, following irregular movements; 2) gross motor coordination – regaining an upright position, locomotor activities, imaginative games, balancing, and exercises involving arms and shoulders, the trunk, and legs and hips; 3) fine motor coordination – cutting, placing, pasting; tracing, coloring, everyday activities, finger tracing. WORKSHEETS: 1) drawing with guidelines; 2) tracing; 3) drawing without guidelines; 4) coloring.

b. *Figure-ground perception.* EXERCISES: 1) discriminating objects in a room; 2) finding objects that are different; 3) sorting; 4) shifting attention; 5) everyday activities. WORKSHEETS: 1) intersecting lines; 2) intersecting figures; 3) hidden figures; 4) overlapping figures; 5) figure completion; 6) figure assembly; 7) similarities and differences of details; 8) reversal of figure-ground.

c. *Perceptual constancy.* EXERCISES: 1) finding the same size; 2) finding different sizes; 3) sorting according to size; 4) finding the same shape; 5) sorting according to shape; 6) matching objects with pictures. WORKSHEETS: 1) shape constancy; 2) size constancy.

d. *Perception of position in space.* EXERCISES: 1) body image, concept, and schema exercises – awareness of parts of the body, locating parts of the body, use of play equipment, directional body movements, drawing human figures, completion of partially drawn figures, assembling parts of the body, relationship of the body to other objects, duplicating various body positions, differentiating left from right, and assembling features and body parts; 2) exercises with two- and three-dimensional objects – squares and diamonds, triangles, rectangular blocks, block patterns. WORKSHEETS: 1) reversals and rotations of whole figures; 2) position of details; 3) mirror patterns.

e. *Perception of spatial relationships.* EXERCISES: 1) positions of three-dimensional objects; 2) patterns of three-dimensional objects. WORKSHEETS: 1) related positions of two objects; 2) similarities and differences; 3) shortest path to a goal; 4) figure completion; 5) connecting dots; 6) recall of motor sequences; 7) spatial sequences; 8) assembly of parts.

9. *Basis for selecting items and activities* The Frostig Program focuses on five visual-perceptual abilities that the authors believe have great relevance to the learning abilities of children. The five areas and the authors' views as to their importance are as follows:

a. *Visual-motor coordination.* The ability to coordinate vision with

movements of the body or parts of the body (*4*). The exercises in this program are designed to develop printing, writing, and drawing skills. They also help children become acquainted with two-dimensional forms and position of forms on a sheet, and help develop the integration of visual and fine muscle skills in general. Therefore, they have implications for all activities requiring fine hand movements. Well directed eye movements are a prerequisite for reading and for most other school work, and good coordination of hand and eye is necessary for writing.

b. *Figure-ground perception.* "The figure is that part of the field of perception that is the center of the observer's attention. . . . an object cannot be accurately perceived unless it is perceived in relation to its ground. . . . A child with poor figure-ground discrimination characteristically appears to be inattentive and disorganized." Difficulty in screening out obtrusive stimuli may prevent a child ". . . from separating himself from a particular stimulus" – making him stimulus bound. He may continue with one activity in a repetitive fashion, unable to change activities at will. A child with this disability may appear careless in his work because he is unable to find his place on a page, skips sections, and fails to solve familiar problems that are presented on crowded pages because he cannot pick out the relevant details (*4*). The objective of figure-ground exercises is to develop the children's ability to read words in their proper sequence and to see relevant letters and words distinctly without confusing them with the surrounding letters and words. The ability to distinguish figure from ground is necessary for the analysis and synthesis of words, phrases, and paragraphs, without which it is impossible to learn to read. This ability is also indispensable for locating information in a certain place on a page, such as in a table of contents or a dictionary.

c. *Perceptual constancy.* Involves ability to perceive that an object possesses unchanging properties such as a specific shape, position, and size in spite of the variability of the image on the retina. Three other aspects of objects that may be visually perceived as constant are size, brightness, and color. Exercises for perceptual constancy should help develop children's ability to generalize with regard to visual material, to recognize geometrical forms regardless of size, color, or position, and later to recognize words they have learned if they occur in an unfamiliar context or manner.

d. *Position in space.* ". . . perception of the relationship of an object to the observer." A child with faulty perception ". . . of position in space is handicapped in many ways. His visual world is distorted, he is clumsy and hesitant in his movements, and he has difficulty understanding what is meant by the words designating spatial position, such as *in, out, up, down, before, behind, left, right*." Letters, words, numbers, pictures appear distorted and thus confuse him. This ". . . makes it difficult if not impossible for the child to learn to read, write, spell, and do arithmetic" (*4*).

e. *Spatial relationships.* ". . . the ability of an observer to perceive the positions of two or more objects in relation to himself and in relation to each other" (*4*). Adequate perception of spatial rela-

tionships permits the proper perception of the sequence of letters in a word, the sequence of processes in long division problems, the relation of parts in a three-dimensional object and in such two-dimensional representations as maps and graphs.

10. *Adequacy of directions; training required to use the program* The directions for administering this program are comprehensive, but easy to follow. No special training is required. The preparatory exercises in each of the five visual-perception areas are explained thoroughly. The directions for the worksheets are minutely detailed. This program is presented informally, always considering individual differences. Much latitude is given to the administrator, within the prescribed design.

11. *Mental functions or traits represented in the activities* All of the activities seem to focus on what the authors intended. In the body awareness exercises, the child does become aware of self, and the exercises reinforce his sense of identity and body image. The directional body movements help to encourage the child to relate to an object in space or to perceive the position of something in relation to his body. The gross motor and fine motor coordination exercises do appear to help improve coordination. The eye movement exercises help to encourage a left-to-right progression, stimulate peripheral vision, reinforce eye focusing. The visual-motor worksheet exercises seem to encourage visual-motor coordination. The activities and worksheets for figure-ground perception help the child to discriminate between figure and ground. The perceptual-constancy activities and worksheets also seem to encourage perceptual recognition of objects regardless of size, shape, position or color. The activities and worksheets for the position in space criteria seem to relate the body to objects in the child's visual field in a particular direction; i.e., up, down, left, right. The spatial relationships worksheets are designed to encourage perception of patterns and spatial sequences.

12. *Comments regarding design of the program* The program is designed around a tightly prescribed notion of skills, yet can be presented informally. The preparatory training exercises can be carried on throughout the program at the teacher's discretion. The tasks on the worksheets increase in difficulty in each of the five visual-perceptual areas so that any part of the entire program can be used. The program is designed to enable the teacher to fit the materials to particular needs of the pupils.

Although the program is divided into five areas of ability, the areas are probably not totally separate and distinct. Training in one area, therefore, may result in some improvement in another. To some extent, one area is more highly correlated with reading skills than another (Chapter 9, Section 13), and the areas showing higher correlation should probably be stressed in training programs. The program's rationale (Section 9) suggests training provided in one area will assist a child in avoiding a variety of difficulties subsumed under the area. It is likely that several of the skills called by the same name (e.g., figure-ground perception) are to some degree separate and independent; it may be too much to expect that the training provided in an area will attend to all the difficulties listed under that area (Section 9).

13. *Evidence of validity of the program* The studies cited in this section are concerned with remedial, disadvantaged, and special populations

(mentally retarded). Studies on the predictive value of the FDTVP and studies on the use of the Frostig programs with general populations are reported in the review of Pictures and Patterns (Chapter 9) which is intended as the developmental program.

Frostig and Horne (*4*) report that a pilot study with educable retardates indicates that perceptual training can improve the retardates' skill in making figure-ground discrimination, appreciating figure constancy, and dealing with spatial relations. Studies by Allen, Dickman, and Haupt (*1*) and Talkington (*6*) demonstrated that employing Frostig visual-perceptual training with mentally retarded children improves visual perception abilities as measured on the FDTVP. These results demonstrate the effectiveness of the Frostig Program for improving performance on the FDTVP by mentally retarded children. This does not necessarily imply the Frostig Program effects change in reading readiness, as measured on traditional readiness tests, or higher performance in reading or other academic skills.

Alley and others (*2*) report that disadvantaged kindergarten children who received sensorimotor and visual perception exercises did significantly better on the FDTVP than a control group who received the regular kindergarten program. The Frostig Program group also did significantly better on five subtests of the Metropolitan Readiness Test. This finding supports the report by Frostig and Horne (*4*) that, in a study of the effect of their program on reading readiness of disadvantaged children, eight months of training resulted in higher performance on a reading readiness measure than attained by a control group. These findings indicate the Frostig Program is effective in improving reading readiness of disadvantaged children.

Brown (*3*) studied the effectiveness of the Frostig Program with male students in special classes for the educationally handicapped in grades three to six. He found the Frostig Program produced no significant gains on either the FDTVP or the Gilmore Oral Reading Test.

Stern (*5*) compared the effects of Frostig training, corrective reading instruction, and a placebo program on reading progress of primary school-aged corrective readers. He found that the Frostig Program was of dubious value for improving visual perceptual skills, that Frostig and corrective reading groups were equivalent in oral reading, and that all three groups were equivalent in silent reading. Evidently, there was some value to Frostig training for oral reading (compared to placebo group) but no advantage over corrective reading instruction.

14. *Comments regarding validity for particular purposes* The Frostig Program, when applied to mentally retarded and disadvantaged children, appears to teach the visual perception skills measured on the FDTVP (*1, 4, 6*). None of the studies on the mentally retarded cited above determined whether there was any effect of Frostig training on reading readiness or achievement. There was some evidence that the program contributes to improving reading readiness of disadvantaged children (*2, 4*). There was no conclusive evidence that the Frostig Program contributes to reading achievement; and no evidence that it is superior to corrective reading instruction when applied to remedial populations (*3, 5*).

15. *Trial population* The program was developed at the Marianne Frostig Center of Educational Therapy in California.

16. *Comments regarding trial population* Detailed information concerning typical performance of the trial population was not provided in the Teacher's Guide.

17. *Comments of reviewers* No reviews were located.

18. *General evaluation* The Frostig Program is carefully designed to present training in five areas of visual-perceptual ability. The directions for administering the program are comprehensive, clear, and easy to follow. Evidence has been cited that the program successfully teaches mentally retarded and disadvantaged children the visual perceptual skills measured on the Frostig Developmental Test of Visual Perception. This fact by itself does not mean the Frostig Program contributes to reading readiness or achievement. Other evidence indicates that the program contributes to the improvement of reading readiness of disadvantaged children. Further research is needed on whether the program contributes to reading achievement of disadvantaged children, mentally retarded children, and children who are retarded in reading due to inadequate visual-perception ability.

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Chapter 9

PICTURES AND PATTERNS: THE FROSTIG DEVELOPMENTAL PROGRAM

1. *Title* Pictures and Patterns: The Developmental Program in Visual Perception.

2. *Authors* Marianne Frostig, Ann-Marie Miller, and David Horne.

3. *Publisher* Follett, 1010 West Washington Boulevard, Chicago, Illinois 60607.

4. *Dates of publication* An extensive revision of the Teacher's Guide is now in press. Beginning and Intermediate Pictures and Patterns, 1966; Advanced Pictures and Patterns, 1967.

5. *General type* Perceptual-motor training.

6. *Purpose* A developmental program to train young children in visual perceptual skills. This program is based on the earlier remedial program, The Frostig Program for the Development of Visual Perception.

7. *Components* The developmental program consists of three workbooks (each with its own Teacher's Guide) called Beginning Pictures and Patterns, Intermediate Pictures and Patterns, Advanced Pictures and Patterns; transparent acetate overlays; and the programed book, Pictures and Patterns: Programed Training for Teachers.

8. *Description of Items and Activities* The development of the Frostig programs went through three phases. First there was the Frostig Developmental Test of Visual Perception. Out of this test grew a remedial program, The Frostig Program for the Development of Visual Perception, which was designed to strengthen the weak areas identified by the Frostig Developmental Test of Visual Perception. A further extension and refinement of the remedial program is the three part developmental program called Pictures and Patterns. When Pictures and Patterns is used in a preventive program, formal testing is not necessary unless a child has severe difficulties in one or more areas.

In the Beginning Pictures and Patterns program, which is planned for preschool, kindergarten, and first grade children having no previous visual perception training, there is instruction in body awareness activities. This is followed by worksheet activities. The areas of training follow.

a. *Body awareness activities.* 1) Mirror – the child should find his image acceptable and pleasant, singing songs about what is seen in the mirror; 2) games in which the children name and touch parts of the body; 3) play equipment – climbing ladder, walking on rail, stepping from one block to another, ascending sloping board, crawling through a tunnel; 4) directional body movements – asso-

ciating body movements with drawing of lines out, in, up; 5) picture recognition – describing simple pictures, making up stories about pictures, arranging pictures in sequence; 6) dramatic play.

b. *Visual-motor coordination activities.* 1) Cutting – parallel slits in paper, simple shapes; 2) placing and pasting – three dimensional objects on an outline, matching cutouts over shape outlines; 3) finger tracing; 4) finger games; 5) construction and manipulative toys; 6) bead stringing; 7) informal games – hide and seek; 8) rhythms; 9) play – jungle gyms, balance boards.

c. *Figure-ground perception activities.* 1) discrimination – pointing out categories of objects, picking out specific items, finding described objects; 2) sorting.

d. *Perceptual constancy activities.* 1) Finding and sorting; 2) picture recognition.

e. *Position in space activities.* 1) Reorganizing position of body in relation to objects – climbing over a chair, jumping over a block, crawling under a table; 2) duplicating a pattern of blocks.

Some of the preceding may be used before worksheets, others are used in conjunction with worksheets. The worksheet exercises are done in the order in which they appear in the workbook. An acetate sheet is placed over the worksheet; this allows the child to keep redoing the worksheet until it is correct. When the child has perfected the skill, he works directly on the paper. There are other exercises in which the child has to draw a straight line or a curved line. If the child has difficulty doing this, the teacher leads him to an appropriate preliminary physical exercise; e.g., the child will move the arm and then the hand in a straight and curved manner. In other worksheets the child is expected to color a geometric figure or object within a boundary, identify parts of pictures superimposed on other parts, trace objects, find geometric shapes and objects in pictures, compare shapes, draw lines without a boundary, and draw a straight line between two points.

Intermediate Pictures and Patterns is recommended as part of the regular curriculum for kindergarteners and first grade pupils who have completed training with the Beginning Pictures and Patterns program. Because perception of spatial relationships develops later than the other perceptual skills, it is first introduced at the intermediate level. The worksheet activities appear in the book in the order they must be used. Again a program of sensory-motor training precedes and accompanies the worksheet exercises.

The physical activities the child will be engaged in at the intermediate level include exercises to develop body image, body concept, and body schema, directionality, agility, flexibility, and muscular strength.

Training in body image, concept, and schema consists of the following.

a. *Body image training.* 1) Awareness of body parts and naming the parts of the body, using alternating movements, using two different body movements simultaneously; 2) feeling of resistance or support; 3) role playing – acting strong or weak, moving like a toy; 4) obstacle course.

b. *Body concept training.* 1) Body functions – locating parts of the body, naming and stating functions of major internal organs; 2)

drawing human figures – naming part of the body that comes next in the drawing; 3) completing partially drawn figures; 4) assembling features and body parts – assembling paper shapes resembling body parts.

c. *Body schema training.* 1) Duplicating body positions and poses.

Visual-motor coordination activities include the following.

a. *Gross motor coordination training.* 1) Changing body positions; 2) locomotor activities; 3) imaginative games; 4) balancing exercises; 5) exercises for flexibility – crawling and rolling over; 6) games and playground activities.
b. *Fine motor coordination training.* 1) Cutting; 2) placing and pasting; 3) tracing and coloring.
c. *Eye movement training.* 1) Exercises for left to right progression; 2) exercises for improved peripheral vision; 3) focusing eyes with head in motion; 4) following regular and irregular movements.

Visual perception training activities include the following.

a. *Figure-ground perception activities.* 1) Finding objects; 2) sorting.
b. *Perceptual constancy activities.* 1) Comparing sizes; 2) finding the same size; 3) sorting according to size; 4) recognizing and naming planes and solids.
c. *Position in space activities.* 1) Directionality – differentiating left and right on oneself; 2) reversing and rotating figures.
d. *Spatial relationship activities.* 1) Making models from wood and other materials; 2) building with blocks; 3) duplicating patterns in a peg board.

Advanced Pictures and Patterns is recommended as part of the first and second grade curriculum for children who have had the first two books. At this level the recommended physical activities are planned to have a closer relationship with academic learning. Some of the physical activities in which the child will take part in the advanced program are listed here.

Sensory motor training activities include the following.

a. *Manipulative activities.* 1) Working with construction toys and such activities as cutting, pasting, painting, lacing, and weaving; 2) assembling such figures as circles and squares, tracing objects, and drawing simple shapes; 3) duplicating designs in a peg board; 4) recognizing directions – left, right; 5) differentiating left and right position of objects in relation to each other; 6) mirror images and symmetry.
b. *Directionality.* 1) Positioning of objects in relation to the child; 2) walking and changing direction as indicated; 3) telling left or right part of another child's body; 4) picking left and right in a picture.

Activities for transition from perception to thought processes follow.

a. *Memory for visual stimuli* (these exercises follow practice in matching and book exercises in perceptual constancy). 1) Memory for single figure – look at a shape, select it from a group of similar objects, draw the shape; 2) memory for patterns – reconstruct a pattern of blocks or pegs from memory, reproduce a pattern pro-

jected on a screen, construct a pattern from verbal directions; 3) memory for visual sequences – reassemble comic strip pictures in sequence, arrange sequence of forms in order originally shown, recall series of acts performed by teacher.

b. *Memory for auditory sequences.* Children remember and follow a series of oral directions or write a sequence described by the teacher.
c. *Visualization.* 1) Children draw a particular thing; 2) children picture something in their minds with eyes closed and then draw it.
d. *Mental manipulation.* Children reproduce pattern of geometrical shapes, then change the pattern by reversing order or changing the position of one figure.
e. *Classification and concept formation.* Sorting and classifying tasks.

Activities for integrating training in visual perception with academic work are illustrated by the following examples.

a. *In arithmetic.* Children use their bodies to demonstrate the progression of numbers and their relationships; children copy problems and write numerals in columns.
b. *In reading.* Crossing out a particular letter, finding facts in a sentence, unscrambling letters, assembling letters from parts, matching letters and words.
c. *In writing and copying.* Discrimination and reproduction of letter-like figures, identifying letters from drawings on a grid.
d. *In spelling.* Analysis and synthesis of patterns in words, and representation of sounds with color-coded letters.
e. *In content subjects.* Looking up place names in an atlas, locating positions on maps and globes.

Workbook activities include identifying pictures, coloring subjects, traveling on a diagram according to instructions, tracing, finding hidden shapes, finding a path through a maze, copying portions of a picture, selecting larger or smaller objects, and drawing patterns.

9. *Basis for selecting items and activities* Perceptual abilities are the focus of the program. According to the authors, perceptual dysfunctions occur frequently among beginning school age children, and perceptual functions are important for beginning school success. The structure of Pictures and Patterns is based on the premises that there are stages in a child's growth, and various abilities normally develop in sequence. Thus, sensory-motor training is seen as preparation for perceptual training proper, just as perceptual training is regarded as preparation for concept formation, and concept formation preparation for academic work. Without the earlier sensory-motor training, the later developmental phase of paper and crayon activities would not be optimally effective.

The visual-motor coordination exercises should help develop the skills necessary for printing, writing, and drawing. They also should help children become acquainted with two-dimensional forms and their position on a sheet of paper, and develop the integration of visual and fine muscle skills in general.

The figure-ground perception activities are intended to help develop the children's ability to read words, work with numbers and other symbols in their proper sequence, and see printed or written symbols distinctly

without being distracted by the surrounding stimuli.

Exercises for perceptual constancy should help develop children's ability to generalize with regard to visual material. They should help children learn to recognize geometrical forms regardless of size, color, or position, and lead them later on to recognize words they have learned if they occur in unfamiliar context or different kinds of printing or writing.

The ability to differentiate letters that have the same form but differ in their position – such as *b* and *d* – and the ability to recognize the sequence of letters in a word and the sequence of numbers depends upon development of perception of position. Without this ability it is very difficult for the child to learn to read, write, spell, and do arithmetic.

According to the authors, a child who is deficient in any of the perceptual abilities discussed here is likely to be handicapped in his academic subjects. When the child goes to school, accurate visual perceptual abilities enable him to read, write, spell, and do arithmetic, and undertake other work involving the accurate recognition and reproduction of visual symbols. However, the difficulties will probably be most apparent in his progress in reading. Since prevention is always simpler than remediation, the authors advocate using this program with all children at the kindergarten or first grade level during their time of maximum perceptual development. Perceptual training should be given as early as possible, both as part of the regular curriculum and whenever perceptual disabilities are known or suspected.

10. *Adequacy of directions; training required to use the program* The purpose and use of Pictures and Patterns is clearly explained in the Teacher's Guide. The directions for the physical training as well as the worksheet exercises are described in detail in the manual – the only place in the program where directions appear. There are no directions printed on the worksheets and the teacher must consult the manual to learn the authors' purpose and how the worksheets are to be used.

A thorough knowledge of the program and the content of the manual is necessary before a teacher begins using the program. To explain the philosophy and overview of the Pictures and Patterns program, the authors developed a programed training book for teachers.

11. *Mental functions or traits represented in the activities* The program purports to improve visual perception by improving the child's ability in visual motor coordination – the ability to coordinate vision with movements of the body or parts of the body; figure ground perception – the ability to perceive an object in relation to the background; perceptual constancy – the ability to perceive that an object possesses unchanging properties; perception of position in space – the ability to perceive the relationship of an object to the observer; and perception of spatial relationships – the ability to perceive two or more objects in relation to each other or the observer.

12. *Comments regarding design of the program* The program appears to be efficiently designed. It does appear that, in attempting to insure that the teacher use the activity for the prescribed perceptual purpose, the guide is too rigid. In the introduction to the guide the teacher is constantly reminded to consult and follow the guide.

Many of the worksheet activities require that the child be given cer-

tain manipulative paper cutouts: designs, equilateral triangles, pieces representing features. These materials have to be made or prepared by the teacher. It would seem that if the program is so explicit as to the manipulative materials needed, then these materials should be commercially prepared. One might argue that a teacher's materials preparation time should be used creatively and experimentally, and not used to follow cookbook type instruction.

Many of the physical activities in this program are typically used in most kindergartens; e.g., games, dramatic play, bead stringing. A major difference may occur in the reliance on body awareness and body concept activities in the Frostig program.

A final criticism: if fine motor coordination for writing is being developed, actual letters of the alphabet should be used rather than tracing drawn pictures.

13. *Evidence of validity of the program* The studies cited in this section are concerned with the predictive value of the FDTVP and the use of the two Frostig programs with general populations. The similarity between the two programs justifies treating research on the two together. Studies on the use of the Frostig programs with remedial, disadvantaged, and special (mentally retarded) populations are discussed in the review of the Frostig Program for the Development of Visual Perception, intended as the remedial program, in Chapter 8.

Evidence that performance on the FDTVP is correlated with reading achievement is found in several studies. Jacobs, Wirthlin, and Miller (*6*), found that the FDTVP had a low correlation with later performance on the Stanford reading subtests. Olson (*8*) tested third grade children on the FDTVP and the California Achievement Test as well as four tests of specific reading skills. He found the total FDTVP a fair predictor of all reading subtests. However, correlation between Frostig subtests and reading tests ranged from moderate to not significant. Two Frostig subtests (figure-ground and position in space) were not significantly correlated with any reading test. Leibert and Sherk (*7*) investigated the relationships between kindergarten, first, and second grade pupils' performance on the position in space and spatial relations subtests with their performance on tests of letter discrimination, word discrimination, and phrase discrimination, and the relationship between second grade pupils' performance on the figure-ground subtest and a test of word identification. The purpose was to test tasks specifically referred to by Frostig. They found evidence of moderate relationship between performance on reading tests and performance on the FDTVP subtests for kindergarten pupils. Other correlations between position in space and spatial relations subtests with reading tests were low to moderate. Magnitude and number of significant correlations decreased as grade level increased. The figure-ground test had a low positive relation with word identification for second grade boys.

Evidence that training with Frostig materials and procedures led to improvement in visual-perceptual skills as measured on the FDTVP is found in the research by Jacobs (*5*), Jacobs, Wirthlin, and Miller (*6*), and Rosen (*9*). In general, these materials were from the Frostig Program for the Development of Visual Perception, which was employed in developmental as well as remedial programs prior to the publication of Pictures and Patterns.

The study of Jacobs (5) failed to establish that kindergarten children trained with a Frostig program attained superior reading readiness than did children who were not trained. Doyle (2) found that kindergarten children given Frostig training scored higher than a control group on a readiness subtest of letter names when assessed in first grade. The study by Cowles (1) showed that first grade children given specific visual perceptual training drawn from Beginning Pictures and Patterns performed better than control groups on the Metropolitan Readiness Test. Jacobs, Wirthlin, and Miller (6) found that kindergarten children attained greater reading readiness after Frostig training than a group that received no training.

In the latter study, training with the Frostig program did not result in significantly greater reading achievement. In Rosen's study with first grade children, experimental classes received thirty minutes of Frostig training per day for twenty-nine days. Control classes received thirty minutes more of reading instruction than did experimental classes for these twenty-nine days. Experimental groups failed to attain superior performance in criterion reading measures (9). These studies, then, did not demonstrate that Frostig training resulted in greater reading achievement.

14. *Comments regarding validity for particular purposes* The studies cited indicate that the total FDTVP is correlated with concurrent and later reading achievement. To a lesser extent, subtests of the FDTVP are correlated with reading tests. There is consistent evidence that Frostig training leads to improvement in visual perceptual skills as measured on the FDTVP. There is partial evidence that Frostig training is related to improved reading readiness of kindergarten children and first graders. There is no evidence in the above studies that Frostig training resulted in greater reading achievement. Further research on the effect of Frostig training on reading readiness and reading achievement evidently is needed.

15. *Trial population* The Frostig materials were developed at the Marianne Frostig Center of Educational Therapy. No information was provided by Teacher's Guide to Pictures and Patterns concerning any other trial population for the development of this phase of the Frostig programs.

16. *Comments regarding trial population* The research cited indicates the degree of effectiveness of the Frostig programs with general populations. Descriptions of the populations used in the development of the Frostig programs as reported in the several Teacher's Guides are insufficient for judging the use of Pictures and Patterns with a developmental as opposed to remedial or special population.

17. *Comments of reviewers* No reviews of Pictures and Patterns were located.

18. *General evaluation* There is consistent evidence that Frostig training of a general population leads to improved visual-perception skills as measured on the FDTVP. Therefore, the Frostig programs are suitable for inclusion as part of a developmental curriculum to improve these visual perception skills. However, the result of this training on reading readiness is uncertain, and there is no evidence that it leads to better reading achievement.

It appears that the Frostig program, especially the worksheets, is too structured to be used with all children. The child with deficiencies in visual perception may profit from the structure.

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Chapter 10

FAIRBANKS-ROBINSON PROGRAM – LEVEL 1

1. *Title* Fairbanks-Robinson Program – Level 1: Early Perceptual-Motor Development.

2. *Authors* Jean S. Fairbanks and Janet Robinson.

3. *Publisher* Teaching Resources Corporation, An Educational Service of the New York Times, 100 Boylston Street, Boston, Massachusetts 02116.

4. *Dates of publication* 1967, 1969.

5. *General type* Perceptual-motor training. Perceptual fine-motor and integrative skills for development of primary learning readiness.

6. *Purpose* The purpose is to develop perceptual-motor abilities the authors consider prerequisite to academic functioning. The program is designed for use both as reinforcement and remedial work in kindergarten and first grade, or as a basic curriculum in the special education classroom. Fairbanks-Robinson Program – Level 2: Perceptual-Motor Development develops at a higher level all skills introduced in Level 1, and introduces additional concepts. It may be used as an advancement of Level 1, or as an independent program.

7. *Components* Level 1 includes an instructor's guide, ten sections comprising 200 exercise levels with worksheets, acetate protectors, crayons, "stimulus" book, tactile and puzzle pieces, two pairs of scissors.

8. *Description of items and activities* Level 1 encompasses ten sections that aim to develop the very earliest level concepts of: circular, straight line, and rhythmic movement; left to right and top to bottom progression; basic form recognitions, discrimination and constancy; size and shape; visual orientation; sequencing; attention to detail; irrelevancies and distractions. Tracing, copying, coloring, and cutting activities are involved. The authors recommend that the tasks be practiced with one or two students at a time with direct supervision of the teacher. Section A is to be completed first, followed by Section B. The other sections are then used concurrently.

Section A, Line-Movement Exercises, establishes flowing movement with straight lines, curves, intersecting lines, left to right and top to bottom progression for later pencil and paper skills.

Section B, Shape Recognition and Discrimination, develops form discrimination and concepts of form constancy, order, and sequence, with six basic geometric shapes. It includes worksheets, tactile forms, and puzzles.

Sections C, Coloring; D, Cutting; E, Spatial Orientation; and F, Constancy of Form and Size, develop eye-hand coordination and manipulative skills.

Section G, Figure-Ground Discrimination, develops ability to focus attention on a specific shape against a distracting background, and skills of visual comparison by discovering missing details in similar pictures.

Sections H, I, and J provide varied experiences with spatial relations in a two-dimensional plane. These experiences develop the skills required to organize work on a sheet of paper and to understand the organization of the printed page in a story or textbook. Concepts of order, sequence, progression, position, and orientation are developed with worksheet exercises, mazes, and puzzles.

9. *Basis for selecting items and activities* Apparently the program developed out of the need for a carefully structured sequential perceptual-motor program, set of materials, and coordinated skill-building methods. The authors' experience within the fields of reading and perceptual training and work with children in these areas were probably the prime stimuli. The authors (*1*) report that the exercises were ". . . prepared with adherence to the sequence of development as described by Piaget and Gesell."

10. *Adequacy of directions; training required to use the program* The Instructor's Guide is very explicit and has a format that is easy to follow. Directions are read in a manner similar to the language in standardized tests. Standard directions permit any teacher to properly use the program.

11. *Mental functions or traits represented in the activities* The student learns to recognize and memorize basic forms and shapes, and to understand that the basic shape remains constant regardless of its manner of presentation. He learns to compare, associate, and classify shapes and objects into groups by their sameness, similarity, or difference, and to place them in correct order within sequences. He begins to organize his thoughts to solve simple sequential problems and puzzles. These skills, preparatory to reading and spelling, are intended to help the student later in the identification of letters and numbers and their changing order within word patterns.

Motor exercises, from drawing straight, curved, and intersecting lines to the reproduction of simple and compound forms, reinforce the sensory perceptions and develop eye-hand coordination and manipulative control in preparation for the writing task.

Specific skills developed include: following directions, form and size discrimination, figure-ground discrimination, part-whole organization, left-to-right progression, sequencing, visual-spatial judgment, visual-motor integration, kinesthesis, tactile discrimination, manipulation, and dexterity.

12. *Comments regarding design of the program* The program appears to be consistent with certain ideas of Piaget, who believes the child must proceed beyond the immediacies of perceptual and motor activities and concentrate on activities at higher developmental stages in order to develop intelligence and cognitive thought (*2*). Piaget would support the use of perceptual-motor tasks to foster thought at the sensory-motor level of development and to enable the child to pass on to succeeding developmental stages.

The concepts developed in each of the ten sections are presented in carefully controlled sequences gradually increasing in difficulty. Children thought to require intensive training in any area can progress in small steps at their own pace, with as much repetition as necessary. Other children can

move rapidly through the program, going into an area in depth only as required.

The need for instruction of one or two students at a time is not apparent, and instruction of larger numbers may be reasonable. The use of standard directions may be less desirable than informally presented instructions.

13. *Evidence of validity of the program* Literature search and communication with the author produced no direct evidence of validity to date.

14. *Comments regarding validity for particular purposes* The apparent total lack of empirical studies prohibits any judgment of program validity. At most, it can be said that the activities appear to be the kinds of sensori-motor activities thought to be helpful in cognitive development at early developmental stages. Resemblance to activities in other perceptual-motor programs encourages one to expect that performance in tasks on which training is given can be improved, but that this improvement may not transfer to performance on traditional readiness or achievement tests.

15. *Trial population* No information concerning a trial population was found.

16. *Comments regarding trial population* Absence of this information, together with absence of empirical validation studies, prevents the teacher from knowing the characteristics of typical performance, how performance is apt to vary from child to child, and how consistently a child is apt to perform from activity to activity within a section of the program. Furthermore, it is not possible, except by referring to evidence on apparently similar programs, to judge the effects of the program on building academic readiness and contributing to later academic achievement.

17. *Comments of reviewers* No prior reviews of the program were found in a literature search.

18. *General evaluation* The Fairbanks-Robinson Program appears to cover such basic areas as space and form perception, directionality, integration of subparts into wholes, and organization of details. The concepts of Piaget and of advocates of perceptual-motor training such as Frostig, Kephart, and Getman appear to lend some support to the use of this program for perceptual-motor training. But despite the skills covered and the attempt by the authors to prepare the exercises ". . . with adherence to the sequence of development as described by Piaget and Gesell" (*1*), the absence of information bearing on performance and progress of trial populations, and the lack of research on program validity, prohibit any judgment as to the effectiveness of the program at this time.

References

1. Fairbanks, Jean S., and Janet I. Robinson. *Instructor's Guide: Fairbanks-Robinson Program Level 1.* Boston: Teaching Resources, 1969.
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Chapter 11

ERIE PROGRAM

1. *Title* Erie Program Perceptual-Motor Exercises

2. *Authors* Daniel Hatton, Frank J. Pizzat, and Jerome M. Pelkowski

3. *Publisher* Teaching Resources Corporation, An Educational Service of the New York Times, 100 Boylston Street, Boston, Massachusetts 02116.

4. *Dates of publication* 1967, 1969.

5. *General type* Perceptual-motor.

6. *Purpose* The Erie Program is a series of perceptual-motor exercises for developing form recognition. It is designed to be used at the level of nursery, kindergarten, and primary grades, and is especially intended for children who have learning disabilities based on perceptual-motor deficits. It may be used diagnostically.

7. *Components* The program consists of four parts, each boxed separately with instructions. A separate Instructor's Guide is provided. Part 1 consists of five games; Part 2 consists of six bingo card books and cue cards; Part 3 consists of six workbooks with attached templates; and Part 4 consists of nine different decks of cards.

8. *Description of items and activities* The Erie Program is made up of four units; the exercises in each unit are presented in the form of games. The authors organized the exercises so that they would correspond to the normal maturational sequence expected to occur prior to formal schooling.

   a. *Visual perceptual exercises.* Materials are five game boards and three stimulus devices (a die, a two-sided spinner, and a cloth bag containing eight tactile pieces). The purpose of the unit is to give the child practice in recognizing common geometric forms under increasingly complex conditions. Color is used first to help the child differentiate forms. After mastery of the exercise, color cues are eliminated. Color is later reintroduced to require that the child attend to the form and disregard the color. The child is trained to work from left to right. The eight tactile pieces are included to aid in establishing good visual perception. The child is encouraged to use his dominant hand to grasp and release objects, thus preparing him for the later problems in the use of paper and pencil. The unit also increases the use of thumb and finger so as to encourage neuromuscular efficiency. The authors believe the unit will also contribute to developing an awareness in the child of the position of his body and body parts in space. He should then be able to apply basic position concepts to objects outside his own body.

b. *Perceptual bingo.* Materials are six bingo booklets and stimulus cards in a looseleaf easel binder. These exercises are arranged sequentially, in order of increasing difficulty, from form discrimination to form conceptualization. "The first exercise in each of the six levels utilizes color as an aid to the child in matching the forms on the sheet in his booklet with those on the stimulus cards" (*2*). Subsequent exercises make no use of color and require discrimination on the basis of form alone. Included in this unit are situations requiring integration of eyes and hands as well as motor control. The unit may be used as a screening device to select those children who require individual and intense remediation in form discrimination.

c. *Visual-motor template forms.* Materials include six, two-section booklets of worksheets with bound-in templates and six erasers. The unit is evidently designed to provide practice in the integration of visual-perceptual skills, such as form discrimination and conceptualization, with the motor skills which implement them. The template is used to supply the child with the proper feel of the geometric form that he has learned to recognize. It is organized as a series of simple visual-motor exercises which increase in complexity. A special wood-cased eraser is used in performing the exercises. The emphasis is on the blending of perceptual skills with the motor skills that implement them.

d. *Perceptual card and dominoes games.* This unit provides a series of perceptual card and dominoes games that are modifications of the popular Old Maid and Dominoes. The simple and basic forms which are used in the card games are those with which all the letters of the alphabet can be constructed (*2*). Some examples on the card games skills include: simple form recognition, simple form recognition with color as a distracting element, complex form recognition with color as an aid, complex form recognition without color as an aid, and complex form recognition with figure-ground interference.

9. *Basis for selecting items and activities* The authors state that the materials in the program employ ". . . widely accepted concepts in perceptual-motor training." They state further that the strong motivational factors inherent in children's games should contribute to the success of each exercise (*2*). It is apparent from these opinions that the authors consider the several exercises, presented in game form, appropriate ways of developing form recognition.

10. *Adequacy of directions; training required to use the program* The Instructor's Guide provides an excellent, concise, but complete, set of directions for the precise way in which the program can be used. The sixty-odd separate exercises plus variations are clearly explained in the guide. The instructions are readable and easily applied.

11. *Mental functions or traits represented in the activities* The following skills are included in the program: form discrimination with and without color as an aid or distractor, figure-ground problems, visual-motor exercises, eye-hand coordination, grasp and release, left-right sequence, finger-thumb opposition, tactile discrimination, kinesthetic reinforcement,

crossing in the middle, form conceptualization, extension-flexor movement, form constancy, position in space, form sequencing. These skills are developed in the program as a whole (all four units).

12. *Comments regarding design of the program* The authors state that an assumption "underlying the development of perceptual-motor exercises is that basic readiness skills are not as readily acquired by some children as by others." They state that a high correlation exists between certain types of reading disability and deficits in certain perceptual-motor functions. "It is to the population of primary grade students who have some degree of difficulty in developing reading skills that these exercises are directed." The authors believe that "by following certain simple maturational sequences the child who has difficulty with perceptual tasks or with the more complex perceptual-motor integration may be helped significantly in preparing for reading" (*2*). The program appears to be the result of a considered attempt to provide those simple maturational sequences that the authors believe will contribute to readiness. The selection of areas for training, especially if intended for children with perceptual-motor deficits, would be supported by Frostig and Horne (*1*), Kephart (*3*), and Strauss and Lehtinen (*4*).

13. *Evidence of validity of the program* No studies on program validity were found in a literature search or provided by the Instructor's Guide or by the publisher.

14. *Comments regarding validity for particular purposes* Although intended for use with preschool and primary level children, especially for those with perceptual-motor deficits, the apparent total lack of research on program validity makes it impossible to judge the effectiveness of the program with that population. As noted above, the program's activities appear to be consistent with recommendations of other authorities (*1, 3, 4*). However, though the program may ultimately prove helpful in developing form recognition, the transfer to academic skills may be limited. It is very likely, for example, that direct work with letter discrimination would prove more effective at developing that skill than the training on basic forms, with which letters can be constructed, provided by the Perceptual Card Games.

15. *Trial population* The Instructor's Guide provides no information concerning trial population; the publisher could provide no information.

16. *Comments regarding trial population* It is not known whether the program was systematically field tested. Therefore, information regarding typical performance, variability of performance that might be expected, stability of performance by a child over a period of time, and whether certain tasks are particularly easy or difficult, is lacking.

17. *Comments of reviewers* No reviews of the program were located.

18. *General evaluation* The Erie Program is intended for preschool through primary level children with perceptual-motor deficits. The program is designed to build form recognition by employing a variety of games. The units appear to be designed and arranged sequentially to provide practice with increasingly more complex visual-motor-perceptual tasks. The absence of information concerning a trial population and the

absence of validation studies preclude any conclusive judgment concerning the program's ability to teach form recognition or to transfer to academic skills. Results with programs that teach similar skills suggest that the activities of the Erie Program are probably helpful in teaching form recognition, but may be less satisfactory for teaching such academic skills as letter recognition than direct instruction in these academic skills.

References

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2. Hatton, Daniel, Frank Pazzat, and Jerome Pelkowski. *Instructor's Guide: Erie Program.* Boston: Teaching Resources, 1969.
3. Kephart, Newell. *The Slow Learner in the Classroom.* Columbus, Ohio: Charles E. Merrill, 1960.
4. Strauss, Alfred A., and Laura E. Lehtinen. *Psychopathology and Education of the Brain-injured Child.* New York: Grune and Stratton, 1947.

APPENDIX

PUBLISHERS AND MATERIALS

American Guidance Service
Publishers Building
Circle Pines, Minnesota 55014

Peabody Language Development Kit – Level 2		
Manual		$ 10.50
Stimulus cards (424)		29.50
"I wonder" posters (12)		7.75
Casette or 5" magnetic tape		5.00
plastic chips (500)		9.50
puppets (2)	each	4.00
Teletalk		15.00
Metal case		10.00
Total		$ 70.00

Follett
1010 West Washington Boulevard
Chicago, Illinois 60607

Frostig Program for the Development of Visual Perception		
Teacher's Guide and ditto sheets (359)		
Total		$ 98.62
Pictures and Patterns		
Student book		
Beginning		$ .84
Intermediate		.93
Advanced		1.05
Teacher's Edition		
Beginning		1.98
Intermediate		2.52
Advanced		2.52

McGraw-Hill
Manchester Road
Manchester, Missouri 63011

Developing Learning Readiness		
Introduction to DLR		$ .36
Teacher's Manual		6.99
Webstermasters (116)		19.50
Moveable Melvin		
(30 for pupils)		12.50
for teacher		6.50
Chalkboard templates (5)		7.50

Space masks (30)	9.00
Triple size chalk (12)	.95
Filmstrips (15 black and white)	75.00
Targets (8 printed, 4 blank)	1.50
Eye movement charts (3)	5.00
Desk templates (2)	3.95
Space sighters (6)	2.40
Tachistoscopic flashing device	29.95
Total	$168.00

Teaching Resources Corporation
100 Boylston Street
Boston, Massachusetts 02116

Auditory Discrimination in Depth	
ADD Program complete with Instructor's Guide Text Materials for eight students	$ 49.50
Additional Students Kit and partial materials for two to four students	$ 16.50
An Introduction to Auditory Discrimination – sound filmstrip	$ 9.95
Erie Program	
Erie Program complete	$ 69.95
Erie Part 1 – Visual-Perceptual Games (for 10 students)	25.00
Erie Part 2 – Perceptual Bingo (for 6 students)	19.00
Additional Bingo Books (6)	7.00
Erie Part 3 – Visual-Motor Template Forms (for 6 students)	16.00
Additional Template Forms (3 books)	4.95
Erie Part 4 – Perceptual Card and Dominoes Games (9 decks)	12.00
Fairbanks-Robinson	
Fairbanks-Robinson Program – Level 1 Complete	$ 79.00
Section C, D, and G Exercise Sheet Refills (4 sets)	7.60
Large Heavyweight Acetate Protectors (3)	4.50
Pathway School Program	
Pathway School Program complete	$ 15.00
Additional Student Materials only	12.00

Winter Haven Lions Research Foundation
Box 111
Winter Haven, Florida 33880

Perceptual Training Procedures
Basic Perceptual Testing –
Training Kit for First Grade Teachers
Teacher's Test Manual
Perceptual Testing and Training Handbook
Set of Targets for Group Testing
Scoring Sheets with Incomplete Forms
Form Templates
Total $ 18.50

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Ruth Strang

Tests of Reading Readiness and Achievement
Farr and Anastasiow

How to Read a Book
Sargent, Huus, and Andresen

Teaching Reading Skills Through the Newspaper
Arnold B. Cheyney

Reading Tests for the Secondary Grades
Blanton, Farr, and Tuinman

Inservice Education to Improve Reading Instruction
Otto and Erickson

Perceptual and Language Readiness Programs
Maurice Kaufman